JANUARY, MDCCCLVI.

THE ZOOLOGIST:

A

POPULAR MONTHLY MAGAZINE

OF

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AND

JOURNAL FOR RECORDING FACTS & ANECDOTES

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THE ZOOLOGIST

FOR 1856.

NOTICES OF NEW BOOKS.

'*The Natural History of the Tineina.*' Vol. I., containing Nepticula, Part I., and Cemiostoma, Part I. By H. T. STAINTON, assisted by PROFESSOR ZELLER and J. W. DOUGLAS. London: Van Voorst. Paris: Deyrolle. Berlin: Mittler and Son. 1855. Demy 8vo, 338 pp. letter-press; 8 coloured plates: *price* 12*s*. 6*d*.; to Subscribers 7*s*. 6*d*.

IT is difficult to realize the idea of a complete work of which an 8vo volume of 338 pages is but the tithe of a first instalment of an unlimited number of series. The most sanguine of entomologists will scarcely contemplate the possibility of living until the last volume of the last series shall be complete. It is not, however, the province of the reviewer to scan, through the telescope of imagination, the dim prospect of a far-off future: his part is to deal with the first volume of the first series just as it were the first, the last, and the only one. Viewed in this light, the present volume is most valuable; it gives us the histories of twenty-one species of Nepticula and three of Cemiostoma; all of them patiently worked out and illustrated by excellent figures of the larva, food-plant and imago: there are, however, no figures of the pupa, and this I feel an omission: it is true they may be very similar in the several species, and this might be a sound argument for not repeating them—it is scarcely one for omitting them altogether. To myself it has always been a matter of regret that more attention was not paid to the preparatory states of all our insects: it is true that these states are often less enduring than the perfect insect; and it is also true that we are naturally apt to prefer the tangible and the visible: the acquisition and diffusion of knowledge for its own sake, and irrespective of all ulterior utilitarian objects,

BRITISH MUSEUM

are tastes confined to the few. Mr. Stainton is one of these; and it is also his constant aim to go to Nature herself as the fountain-head of such knowledge: for myself, I have long since learned that it is dangerous and inexpedient to elicit materials from any other source: frequently as the writings of others may guide us to the truth, they should be availed of simply as guides to the source, and not as the source itself: nothing should be substituted for personal observation, except when personal observation cannot be brought to bear. Mr. Stainton entertains and has often advanced these views, but it appears to me that he scarcely carries them out in that thorough-paced manner which he himself would recommend to the rising generation of naturalists. As an example: Degeer is an excellent guide, perhaps the very best in many cases, but it is making rather too free with this eminent naturalist to occupy so many pages with an extract from his description of Nepticula anomalella, an insect so abundant that, as Mr. Stainton observes, "if we examine our rose-bushes in the months of July and October we can hardly fail to observe on some of them that many of the leaves are marked with its 'pale serpentine tracks.'" Mr. Stainton evidently has all the materials for a history of the insects, and he is quite right in fairly acknowledging the value of Degeer's previous labours; but he need not have cited them either in addition to or in lieu of his own. There is a strong reason for noticing and even dwelling on this point, namely, that if we have each individual history thus doubly elaborated, the work becomes extended beyond the limits actually required to render the subject clear and intelligible; and the eventual completion of the work is indefinitely procrastinated.

The letter-press is in four languages, English, French, German and Latin, printed in four parallel columns, the object of which is to extend the circle of readers, and, as a consequence, the sphere of utility. I should demur to this expensive proceeding as unnecessary, believing English sufficient for ourselves and Latin for all other nations, did not the price at which the work is issued show that the author is totally regardless of pecuniary compensation; indeed we are told, and I readily believe it, that the plates alone absorb the entire price of the volume. This principle of ignoring profit seems to pervade the whole of Mr. Stainton's literary labours. We accept this as a generous act in each individual instance: we feel indebted to Mr. Stainton for selling us a handsome volume at the mere cost of colouring the plates; but how will it act hereafter? what effect will be produced by comparing this price with that of future works published by entomologists who can neither give their time nor their money to the public?

These remarks are statistical, economical, general: now for a remark entomological. So little is known of the larvæ of our Micros in general, and of our Nepticulæ in particular, that the entomologist eagerly seizes on every scrap of information respecting them. I sought at once to devour and digest the store of facts which I expected to find recorded on these minims of Lepidoptera; but I rose from the investigation somewhat dissatisfied. My readers shall judge whether reasonably so. For the larvæ of the genus Nepticula Mr. Stainton gives this general definition:—

"The larvæ are especially distinguished by the absence of true horny legs, and the undeveloped condition of the membranous legs, which here serve alike for legs and prolegs, none having the coronet of little hooks; with the exception of the segment behind the head, and the anal segment, each segment bears a pair of these unusual legs, making eighteen in all, although the third pair are less developed than the others, and more easily overlooked."—p. 2.

The word "distinguished" appears susceptible of improvement or qualification: they are distinguished from Macro-Lepidoptera by this character, but my eyes greatly deceive me if they are not by this very character associated with other mining Micros; but my objection is not confined to what may very possibly be a mere error in the choice of words. The criticism I am about to make touches a question of fact. Waiving the rule which I believe to be absolute, "that no winged insect can have more than six legs in any of its states," I admit that these six may be entirely wanting, or may be reduced to so rudimentary a state as to assume the appearance of a mere point, or even of a fold in the skin; and I admit also that the ventral adhering disks may, like analogous disks on the head or throat of fishes, or like the prostrate belly of mollusks, serve the purpose of legs as far as regards prehension, and, in some degree, locomotion; nevertheless, experience teaches that there is an orderly disposition, a general rule, for the location of both disks and legs as regards the segments on which they may occur. The larvæ of Lepidoptera have thirteen segments; No. 1 is the head; Nos. 2, 3 and 4 bear the legs; No. 5 is without appendages; Nos. 6 to 12 bear the disks; and No. 13 has two appendages, infinitely various in structure and function in different genera and families. Now the disks are liable to disappear from, or to become rudimentary on, the 6th, 7th, 8th, 9th and 10th segments; but they are not liable to appear on the 5th, and the assertion that legs or disks appear on this segment requires to be received, or rather to be scutinized, with the greatest caution. It is somewhat remarkable that two only of the figures of larvæ represent them in a position to exhibit these anomalously placed legs or disks: these are the larvæ of plagicolella and septembrella, figs. 1 and 2 of Plate IV., and it is still more remarkable that these figures tally with my previously conceived opinion, and are at variance with Mr. Stainton's description: in both instances the fifth segment is represented as totally devoid of all appendages. The late William Wing—and it always gives me a melancholy pleasure to mention the name of that painstaking and amiable naturalist—was too accurate to have made an error in these instances, so that I cannot avoid the conclusion that Mr. Stainton's diagnosis requires revision.

In conclusion, I may sincerely say that, willing as I am to point out error, real or supposed,—to mention faults that I conceive to be susceptible of improvement,—I consider this first volume of the 'Natural History of the Tineina' to be a most valuable and praiseworthy production, and that its author is deserving of our warmest thanks.

'*The Microscope, and its application to Vegetable Anatomy and Physiology.*' By Dr. HERMANN SCHACHT. Edited by FREDERICK CURREY, M.A. Second Edition, considerably enlarged, with Numerous Illustrations. London: Highley, Fleet Street. 1855. Fcap. 8vo, 202 pp. letter-press, 130 woodcuts.

WE spoke so favourably of the first edition of this work that it were needless repetition to express a second time our opinion in its favour. The editor shall himself describe the difference between the second edition and the first.

"The rapid sale of the first edition of this translation has rendered a second necessary; and I wish to direct attention very briefly to the points in which the present edition differs from the preceding. Four chapters have been added at the beginning of the book; the first of which relates to some elementary principles of Optics essential to a proper comprehension of the Microscope; the second contains a description of different kinds of English Microscopes, including, as far as is necessary, the details of their different parts; the third contains an account of the accessory apparatus and chemical re-agents necessary for microscopical investigations in Botany; and the fourth relates to the preservation of specimens. I have myself added these Chapters, with a view of rendering the work more complete as a

Manual for English Students, and am, therefore, responsible for the contents of them, with the exception of the list of chemical re-agents in Chapter III., which is to be found in the original work. Besides the addition of the above four chapters, I have been furnished by Dr. Schacht with a quantity of new matter in manuscript, being the result of his investigations since 1852, and this new matter has been incorporated in the text; the present edition is, therefore, considerably in advance of the original work. At the suggestion of Dr. Schacht, I have added the Chapters IX., X. and XI., which contain an interesting account of the embryogeny of the Coniferæ, and are a translation of a portion of a work published by him in the course of last summer, entitled 'Beiträge zur Anatomie und Physiologie der Gewachse.' Chapters VII. and VIII. of the first edition, which related to drawing and to the preservation of objects, have been omitted; but the student will find what is necessary upon these points, under the head of 'Delineating Apparatus,' in Chapter III., and in Chapter IV., which treats of the preservation of specimens."

It will be observed that several chapters are now introduced which occupy an analogous position as regards the microscope to that existing between the Exhibition at Paris and the locomotive which drew us there: the microscope and the locomotive are the means, the structure of Coniferæ and the Exhibition are the ends. Notwithstanding this, we like the introduction of a scientific subject into a work of this kind; we commend every attempt to give a right direction to the microscopic mind, which is but too apt to degenerate into the mere curiosity-shop.

'*A Handbook to the Marine Aquarium; containing Practical Instructions for Constructing, Stocking and Maintaining a Tank, and for collecting Plants and Animals.*' By PHILIP HENRY GOSSE, A.L.S. London: Van Voorst. 1855. 12mo, 48 pp. letter-press: *price* 2*s*. 6*d*.

THIS little book is sufficiently explained by the preceding very comprehensive title and the following brief and explanatory preface:—

"The increasing popularity of the 'Marine Aquarium' demands a Handbook of Practical Instructions for establishing and maintaining it, and I am probably the most proper person to write such a book. Perhaps it might have been sufficient to refer inquirers to my volume on the subject; but the price of that work, arising mainly from the costliness of its illustrations, puts it beyond the power of many persons,

who yet desire to keep marine animals. The main
volume is, moreover, occupied with the habits and
tenants in [? of] an aquarium.

"The concluding chapter of that work has forme
the present handbook. The whole, however, has
and copious additions have been made, bringing it u
state of our experience. The price at which it is i
hoped, bring it within the reach of all."

'*Contributions to the Natural History of Labuan a*
Coasts of Borneo.' By JAMES MOTLEY, of Lab
LLEWELLYN DILLWYN, F.L.S., &c. London: V
Part I. Fcap. 4to, 62 pp. letter-press; 10 colo

THE objects and scope of this truly beautiful w
forth in the prospectus:—

"The residence of Mr. Motley in Labuan affo
Mr. Dillwyn, the authors of the proposed 'Contribu
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thoroughly known to zoologists, and that the habit
constituting that Fauna have been but little observe
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obtained, and shall probably again obtain, may prov
contribution to the science of Zoology, they are in
naturalists the forthcoming publication.

"It is intended that the 'Contributions' shall con
of such animals, both Vertebrate and Invertebrate
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should be figured, of such more especially as are
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the specimens and notes from time to time obtain
possible to adopt any regular order of arrangement;
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itself as the circumstances will admit of. It is hoped
parts will be published annually. Each part will c
sheets of letter-press and ten or twelve coloured plat
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the publication of any parts, and which refer to animal
them, will be given in the part next ensuing."

The contents of Part I. are as follows:—

Class Mammalia. — Order Cheiroptera, Cynopter
Order Insectivora, Sorex Grayii. Order Rodentia,
lanopis, Sciurus vittatus, Sciurus modestus, Sciurus ruf
Ruminantia, Tragulus Kanchil.

Class Aves.—Order Raptores, Phodilus badius. O
Macropteryx Klecko, Macropteryx comatus, Hirundo
stomus pacificus, Halcyon Chloris, Halcyon lilacina, C
Merops badius, Nectarinia pectoralis, Nectarinia javan
cingalensis, Dicæum croceoventer, Dicæum coccineu
sepium, Copsyphus Stricklandii, Motacilla cinereocapilla,
coronatum, Pitta cyanoptera, Turdus modestus, Irena p
Panayensis, Gracula javanensis, Amadina sinensis. Or
Palæornis malaccensis, Psittaculus galgulus, Megala
Hemilophus leucogaster. Order Columbæ, Treron ve
phaga luctuosa. Order Gallinæ, Megapodius Cum
Grallæ, Ardea purpurea, Ardea garzetta.

Class Reptilia. — Order Saura, Hydrosaurus Sal
rufescens, Platyurus Schniderianus, Gecko monarchus,
Gonyocephalus chameleontina, Bronchocela cristatella.
dia, Trimesurus maculatus, Trimesurus subannulatus,
Dendrophis Paradisei, Dendrophis picta, Dryiophis p
dendrophila, Dipsas fusca, Calamaria brachyorrhos.

This summary is given to show the range of subje
each animal appears to be carefully described, and to
description is appended some account of the habits o
many of them are highly interesting. The coloured fi
and Ford are admirable. The work is fitted alike for
the student and the table of the drawing-room. Now a
space can be found, an extract or two, touching the
customs of the Labuan animals, will be transferred to t

'*The Natural History Review.*' No. VIII., dated
price 2*s.* 6*d.* London: Highley.

The following papers, read before Irish Societies,
present number: the titles will sufficiently indicate tha
especial bearing on Zoology:—

'On the Advantage to Botany of Local Lists, and Notes with reference to the Algæ of the East Coast of Ireland.' By Gilbert Saunders.

'List of Marine Algæ collected at Skerries, near the Northern Limit of the proposed Dublin District, in the Summer of 1854.' By Gilbert Saunders.

'On the Effects of the Severe Frost on Plants in the Neighbourhood of Sligo.' By the Right Hon. John Wynne.

'*Quarterly Journal of Microscopical Science, including the Transactions of the Microscopical Society of London.*' Edited by Edwin Lankester, M.D., F.R.S., F.L.S., and George Busk, F.R.C.S.E., F.R.S., F.L.S. London: Highley. No. XIII., dated October, 1855; *price* 4*s*.

The contents of the October number are as follows:—

'Notice of some New Species of British Freshwater Diatomaceæ.' By William Carpenter, M.D., F.R.S.E.

'An Account of the Structure and Relations of Sagitta bipunctata.' By G. Busk, F.R.S.

'On the Magnifying Power of Short Spaces, illustrated by the Transmission of Light through Minute Apertures.' By John Gorham, M.R.C.S.E., &c.

'Notes and Observations on the Sap-circulation of Plants.' By F. H. Wenham.

'Hartig on the Phytozoa of Antheridia.' By F. Currey, Esq., M.A.

'On a Universal Indicator for Microscopes.' By J. W. Bailey.

'On the Impregnation and Germination of Algæ.' By M. Pringsheim. [Abridged from the Reports of the Berlin Academy.]

'On Sphærozoum, *Meyer* (Thalassicolla, *Huxley*), Noctiluca and the Polycystinæ.' By Professor Müller. [Translated from the Report of the Berlin Academy, April 19, 1855.]

'On the Development of the Spermatozoids in Torrea vitrea.' By M. A. de Quatrefages. [Translated from the Annales des Sciences Naturelles,' 4th Series, vol. ii. p. 152.]

'On the Influence of Dilute-Sulphuric Acid on the Deposit Layers of the Cell-Wall in its Earliest Condition.' By Dr. T. Hartig. [Translated from the Botanical Zeitung, March 30, 1855, p. 222].

'On the Cystolites or Calcareous Concretions in the Urticaceæ and other Plants.' By H. A. Weddell, Aide-Naturaliste in the Jardin des

Plantes. [Translated from the Annales des Sciences Naturelles, 4th Series, vol. ii. p. 267.]

Notes and Correspondence:—The Circulation in Aqueous Plants; by Mr. James Western. On the Starch Grain; by O. Maschke. Aperture of Object-glasses; by Mr. F. H. Wenham. On the Structure of the Frond of Polysiphonia fastigiata. Further Remarks on the Fly's Foot; by Mr. J. Hepworth. Microscopic Preparations.

Proceedings of Societies:—Microscopical.

Zoophytology.

'*Annals and Magazine of Natural History.*' No. 95, dated November, 1855; *price* 2*s.* 6*d.* London: Taylor and Francis, Red Lion Court, Fleet Street.

THE November number of this Journal contains the following papers:—

'Notes on some New or little-known Marine Animals.' By Philip Henry Gosse, A.L.S.

'On the Injurious Effect of Excess or Want of Heat in the Aquarium.' By Robert Warington, Esq.

'On the Mechanism of Aquatic Respiration, and on the Structure of the Organs of Breathing in Invertebrate Animals.' By Thomas Williams, M.D. Lond.

'Notice and Description of a New Species of Spider.' By the Rev. Hamlet Clark, M.A.

'Observations on the Habits of the Stickleback.' By Robert Warington, Esq.

'The Vegetable Individual in its relation to Species.' By. Dr. Alexander Braun. [Extracted from Silliman's Journal for September, 1855.]

Bibliographical Notice:—'Glaucus; or, the Wonders of the Shore.' By Charles Kingsley.

Proceedings of Societies:—Linnean, Zoological.

Miscellaneous:—Bohemian Forests and Peat Bogs; by Dr. Hochstetter [extracted from the Proceedings of the Imperial Geological Institute of Vienna, January 23, 1855]. Occurrence of Diodonta fragilis at Weymouth; by William Thompson, Esq. Description of a Second Species of the Genus Procnias; by Philip Lutley Sclater, M.A. [extracted from the Proceedings of the Zoological Society, November 14, 1854]. Descriptions of some New Species of Birds;

by the Vicomte du Bus de Gisignes [extracted from the Bulletin de l'Academie Royale de Belgique, 1855, vol. xxii. pp. 153—156]. Description of a New Species of Petrogale; by Dr. J. E. Gray, F.R.S., V.-P.Z.S., &c. [extracted from the Proceedings of the Zoological Society, November 14, 1854].

Removal of Vespertilio emarginatus from the List of British Bats, and addition of Vespertilio dasycnemus to it. By ROBERT F. TOMES, Esq.

ON a former occasion (Zool. 4357) I collected and arranged such notices of this species as fell within my reach, but was at the time unable to come to any very satisfactory conclusion, yet felt perfectly certain that more than one species had been described under the specific name of emarginatus. Since that time an opportunity has occurred of inspecting the rich stores in the Museum of Leyden, where are three specimens of this species—one taken near Liège, another at Abbeville, and the third is simply labelled "France." All these are exactly similar to the ones I have before described, from the collection of M. Verreaux, and wholly unlike anything I have seen any account of in Great Britain. M. Temminck's figure is certainly taken from that of Geoffroy, and is by no means a good representation of the species; and I am somewhat puzzled to know how he can use the expression, that to a certain extent it resembles the V. mystacinus, with which he says it can easily be confounded.

Were it not for the circumstance of specimens having been at various times taken near Abbeville, the locality from whence Geoffroy obtained examples, I should very greatly doubt if the figure given by the latter naturalist were not taken from a specimen of V. mystacinus; certainly the figure of the cranium exactly agrees with that of the latter species. The specimens before alluded to as occurring in Warwickshire are evidently similar to examples of V. mystacinus in the Leyden Museum, having an unusually ferruginous colour, and with the ears more notched than usual. I cannot help thinking that it was from a similar specimen that Geoffroy took his figure and description. I still think that the figure given by the Prince of Musignano was taken from V. Nattereri. The figures and descriptions before given (Zool. 4357) will serve to distinguish this species, not only from all British, but from all other European species.

Notwithstanding that Baron de Selys Longchamps speaks of the species as abundant, it appears probable that it is unknown, except in France, Holland and Belgium. In Holland M. Temminck says it is rare, and confined to the northern parts, not appearing abroad until dark, and taking its food over the surface of stagnant water; but it is somewhat remarkable that the Museum of that country does not contain a native specimen. In Belgium the Museums of Antwerp and Ghent do not contain examples, although they have other European species. Our Museums do not possess it, nor is it enumerated in the catalogue of the Mammalia of the Frankfort Museum, made complete up to the present time by the kindness of a friend, who has added to the catalogue all the species supplied to the Museum since its publication. Indeed, the omission of the species by Wagner, in his continuation of Schreiber's work, would seem to indicate that it is not known in Germany.

With respect to the specimen mentioned by Mr. Buckton, I have since had an opportunity of seeing it at the British Museum, and at once gave it as my opinion that it was a young example of V. dasycnemus, *Boie*, the V. limnophilus of M. Temminck's monograph, an opinion I before expressed from reading Mr. Buckton's description. This species appears to be very common in the vicinity of Leyden, and was pointed out to me, flying in considerable numbers over the surface of the water, by Dr. Schlegel, as we were walking in the evening beneath the fine trees bordering the canal that runs round the town. This and the common Noctule were the only species we saw about Leyden.

The result of these examinations tends to the removal of V. emarginatus from the British list, and the addition of V. dasycnemus to it.

The following description of Vespertilio dasycnemus, added at the request of the Editor, is taken partly from that given by M. Temminck, and partly from notes made by myself from specimens in the Leyden Museum:—

VESPERTILIO DASYCNEMUS, *Boie, Isis* (1825). *De Selys-Longch. Études Micromam.*, p. 139 (1839). *Keys. u. Blas. Die Wirb. Europ.*, p. xvi. and p. 55 (1840). *De Selys, Faune Belge*, p. 19 (1842).

V. limnophilus, *Temm. Mon. Mam.* tome ii. p. 176 (1835 to 1841).

V. emarginatus, *Buckton, Linn. Trans.* (Dec. 1853).

Ears of medium size, oval, with the lobe at the base of the outer edge; but moderately developed, varying somewhat in this respect:

tragus nearly straight and tapering, but with the extreme lip rounded. A very small portion of the end of the tail free from the membrane. Wing-membrane springing from the *superior articulation of the metatarsus*, thus leaving the foot wholly free. Fur soft, silky; all the upper parts and sides of the neck, in the male, of a darkish mouse-gray colour; in the female, a little more tinged with brown: chin, cheeks, throat and all the under parts of the body with the fur nearly black at the base, tipped with grayish white; abdomen nearly pure white; a spot of brownish ash-colour marks the insertion of the wings. The whitish tips of the hairs are more or less extended, according to the age of the individual.

Dimensions.

	TEMMINCK.		BUCKTON.
	Old.	Young of the year.	
Head and body	2 in. 8 lines	3 in. 9 lines	3 in. 7½ lines.
Tail	1 „ 7 „		1 „ 5 „
Fore arm	1 „ 8 „		1 „ 7½ „
Expanse	11 „ 8 „	9 „ 7 „	10 „ 3 „

Although the discrepancy in the dimensions here given may appear considerable, it must be borne in mind that Mr. Buckton's specimen is not perfectly adult, the finger-joints still exhibiting cartilaginous articulations, and the fingers themselves being obviously shorter than they would be in the adult state: hence would arise the less expanse. The length of the head and body is only of value when unaltered by the stuffer, *i.e.* when the animal is fresh; but the most valuable and constant measurement in the animals of this order (more particularly the insectivorous section of it), is that of the fore arm, which usually arrives to near its maximum size before the other parts have made more than an approximation to theirs. I may here add that it is rare to meet with any considerable differences in this part in the same species when fully adult, unless, as is sometimes the case, a particular locality influences the size of the species in all its parts; *e.g.* the bats (as well as the other Mammals) of Ceylon and South India are smaller than the same species in other parts of India, and consequently will have the fore arm shorter, but they are there, as in other places, individually similar in that particular.

ROBERT F. TOMES.

Welford, near Stratford-on-Avon,
November 15, 1855.

A Glance over the Cliffs of Moher (*County Clare, Ireland*).—We bestowed our horses within the accommodations so considerately provided for the traveller, and then we slowly ascended the gradual slope, all unconscious of what lay beyond. But how shall I describe the noble sight that burst upon us all at once as we topped the rise of undulating turf strewn here and there with yellow mountain-pansies? The feeling at first of familiarity, as if it had been a scene we had visited before, and then the gradual awe stilling the heart, as it broke upon the soul in all its reality and magnificence. The dark wall that has defied the wasting ocean beyond the reach of history or of man—bulwark of earth—champion of the land! and the white birds, attendant spirits of the precipice, a whirling maze beneath, around, above, all with ceaseless clamour of affection and anxiety—nor without reason. Marked you yon gang of men sitting in a group, who seem so quietly at home, so thoroughly familiar with the wonders of the place? they are not there for nothing. Let us approach them: the coil of polished well-worn rope, the crowbar fixed firmly in the soil—the triple support of confederated hands: it leads to a lower platform, and there you may see the reapers of that extraordinary harvest as they sit, each ready to take his turn of duty. The poor kittiwakes pay a heavy toll—eggs from the nest and young birds from the rock-ledges, noosed, as of old, with rod and snare by the dexterous fowler—they are drawn up by twenties, tucked under the belt of that man now hoisted up a mass of feathers. And why condemn them? theirs is the daring attractive life of the plunderer—appointed check of nature: theirs, too, are the qualities—no mean ones—of courage, readiness and activity. So fare ye well, brave cliffsmen! at your adventurous trade, be the rope ever strong and the hand firm that speed you on your perilous way. Close by, the cliff towers above 900 feet of sheer abyss, and a steady eye may dare survey that awful gulf over which it is related that once two greyhounds were hurried by excess of ardour in the chase, and over which an adventurous spirit may himself be swung, the darling and the wonder of those rugged climbers, and it is an exploit worthy of the trial, to hang in daring glee, with none but sea-fowl to whisper to his palpitating heart, to hang in space the aërial conqueror of birds, while from above the careful guardians of the rope cheer and encourage, with all the generous approval which a seaman will evince when trusting the helm to no faint stranger's hand. It is a deed of enterprise worthy the zeal of an ornithologist. A little further, let us look elsewhere at the fluttering clamorous gulls and circling auks that start every moment from the cliff and describe short circuits, with now a succession of rapid strokes and now an even swinging flight, the guillemots browner, the razorbills blacker of the two, and the lesser puffin also (called "parrot" here) tunnels his way to a secure retreat in the turf of the slopes and ledges: and the chough you may chance to see, and the jackdaw and the rock dove, with earnest beat of its hurrying wings; and they will tell you of the eagle (*H. albicilla*) that shuns approach, and lays his eyrie beneath some overhanging arch, secure from plunder himself though he may not spare. And the gallant peregrine, relic of chivalry, as thou wert its compeer, crossed he not our sight as we skirted the edge—well known by his stalwart form and knightly moustache? How I rejoiced in the absence of the murderous gun, else were the temptation perhaps too great. So gaze down once more ere we go; note the herring gulls, of superior size and hoarser challenge; and on the black rocks, against which the foam is spirting high, observe the great cormorants—seeming at this distance no bigger than crows—till you see one start from his green repose and scurry along the surface with no flagging pinion. And then the long sea line, which you think you might look over from so high a stand, and far in the distance the lonely isles of Arran, wrapped haughtily in clouds, all make a prospect of surpassing beauty, all combine to fill brimful the eye and heart and mind. Carry, too, the eye to that isolated pyramid below us, on which the sea-birds swarm tier above tier, smiling defiance to the fowler from their fortress, as yet inviolate. Is not your head dizzy? you seldom looked down so far beneath your feet as its summit, and yet that is but half the depth a pebble must traverse to reach the water. Is that a seal? your guide hesitates, for it is no easy matter to distinguish him from the rock on which he sits; but they are common enough most days. Turn, then, your attention westward, ye naturalists and sportsmen that like something larger than gnats or diatoms for your quarry. Here is a noble field; not Scotland only is worthy an excursion. There are fewer species of birds perhaps, and less variety breeding in the inland lakes of Ireland, but for one grand feature—the precipice breasting the Atlantic—this place is well worthy of your notice, and the Irish Highlands offer, too, a little-explored country.—*Hesperus.*

Notices of Rarer Birds about Barnsley.—In the natural history of this country, as various species, at no distant period only rare by comparison with others, are now becoming positively so, any notice of rare occurrences possesses an additional, though painful interest, from the consideration that opportunities to study the living subject, in its natural state, are growing less and less, in proportion as the over-anxious desire to possess collections of preserved specimens is encouraged. Of the rarer birds noticed during the present autumn a bare enumeration is here given:—The hooded crow was obtained on the 9th of November; the kestrel, sparrow hawk, longeared owl, brown owl and white owl are the principal birds of prey noted in October; a pair of nightjars from the neighbouring moors in September; and in the last week of August several ringed plovers or dotterells (*Charadrius hiaticula*), the green sandpiper (*Totanus ochropus*) and the black tern (*Sterna fissipes*), which proved a young bird of the year; the upper parts gray margined with brown, and the white collar beautifully distinct, were observed, and some shot, on the newly-formed island in Worsborough Reservoir, a place well adapted for water-fowl, which would add a new and living grace to its rich landscapes, if permitted to come and go unmolested. The last three species are the rarest of those named, but not so rare to this part and to the entire kingdom as the little auk, which occurred near this town last November, about which time the scaup duck and the tufted duck were obtained in this neighbourhood.—*Thomas Lister; Post Office, Barnsley, Yorkshire, November* 9, 1855.

On the Habits of Palæornis Malaccensis.—These handsome birds are not uncommon in Labuan; and are to be seen in the early morning flying about above the tops of the trees in small flocks of six or eight, uttering in their flight a loud, quick scream, very much like the note of the common swift: they are particularly fond of the fruit of the Dryabalanops camphora, which they split open, and eat the curious crumpled cotyledons, in spite of their pungent taste and smell of turpentine. The specimen from which the above description is taken was shot when feeding upon the seeds of the Dillenia speciosa, a shrub about ten or fifteen feet high, and it is the only instance in which we have known them venture so near the ground: when first seen he was busy opening the capsules of the plant, and scraping out the seeds with his beak, never omitting to clip off at a single bite every one he emptied; having done this he dropped himself under the twig he sat on, swinging by one leg to watch it fall: when it reached the ground he testified his satisfaction by a low chirp, and, giving himself a vigorous swing, caught the perch with his other foot, and walked gravely along to another capsule, not hopping, but placing one foot before the other in a most odd-fashioned way.

Another of these parrakeets, which had been pinioned by a shot without being otherwise injured, was placed in a cage, where, soon finding his two long tail-feathers to be an incumbrance, he deliberately turned round, pulled them out, and then walked round the cage evidently to try the effect of his contrivance.—*Contributions to the Natural History of Labuan.*

On the Habits of Dicæum croceoventer in Confinement.—These little birds are not uncommon in Labuan, and have something the habits of the English Regulus; they haunt low brushwood, and continually utter a low, shrill chirp; they are very fearless, allowing themselves to be almost touched before they take to flight: the Malay name, which signifies spark-bird, is very appropriate, as when darting about among the bushes the cock bird really looks as bright as a flash of fire. The nest of this species is about the shape and size of a goose's egg, and is suspended by the small end from some slender twig of a tall tree; it is built of fine green moss and a sort of brown byssus, and lined with some white fibre and a few small feathers: one of these nests was found on a tree which was felled in the jungle; all the young birds, however, except one, had been killed by the fall: the survivor was brought to Mrs. Motley, who succeeded, by great care, in bringing it up, feeding it at first upon rice and banana pulp; as soon as it was strong enough it was placed in a small cage; though very restless, never being for one moment still, it was perfectly tame and fearless, and would sit upon the finger without attempting to fly away, and though its whole body, feathers and all, might have been shut up in a walnut, it would peck at a finger held towards it with great fierceness: for a long time it would only take food from the hand, but afterwards, when food was given it, it dropped and shook its wings rapidly, as we see a hen partridge occasionally do. At first its beak was short, straight and sharp, but as it grew its form gradually changed to that of the adult Dicæums; it also changed its diet, altogether refusing rice, and only occasionally taking plantain; for some weeks it fed exclusively upon sugar and water, which it sucked up like a humming-bird; it was very fond of bathing in a large shell full of water placed in its cage.—*Id.*

Late stay of Swallows in 1855.—Swallows remained unusually late here; I saw them playing about on Sunday, the 11th of this month [November], since which they appear to have departed: they have been known on a former occasion to have remained until the 23rd. I am right in calling them *swallows* and not *martins*, as the brown patch on the throat was clearly seen with a glass.—*George Guyon; Ventnor, Isle of Wight, November* 20, 1855.

The Bohemian Waxwing in Norfolk.—One of these elegant but most uncertain visitors to our coast was shot, a few days since, at Hofton, in this county. It is rather singular that throughout the last long and severe winter not a single waxwing was met with amongst many rarities.—*H. Stevenson; Norwich, November* 15, 1855.

The Palombière of Bagnères de Bigorre.—When at Bagnères de Bigorre, in the department of the Hautes Pyrenées, in October last, I paid a very interesting visit to the Palombière, which is about three miles distant from that place. I had previously seen the Palombarii at La Cava, in the kingdom of Naples, but only in the winter, when they were not at work, and I had never rightly understood the method in which this *chasse* was conducted. The Palombière of Bagnères consists of a row of beech-trees, running half a mile or more in an irregular line along the brow of the hill which forms the north-eastern border of the Vallée de Campan. These trees are planted in clumps of threes or fours, leaving here and there, at intervals, open spaces of from twelve to twenty yards in breadth: these open spaces are occupied by long nets, which are raised by pulleys (attached to the ends of poles affixed to the trees) to a height of perhaps forty feet from the ground. At each of the top corners of the nets a stone is tied, so that, when the string which passes through the pulley is let loose, they fall quickly to the ground. In front of the line of trees, some thirty or forty yards, stand several very tall slender poles,—raised, by splicing two or three together, to upwards of eighty or ninety feet in height,—and a-top of which are placed rudely-formed cradles occupied by boys, who, raised aloft in the air at this apparently dangerous elevation, play an important part in the proceedings: they are furnished with several roughly-carved flat pieces of wood, made something like a pair of wings with a handle at the end, called *eperviers*, i. e. hawks. The pigeons arrive from the Plains of France, and come up the slope of the hill to cross over into the Valley of Campan, on their route southwards through the Pyrenees: they are of two species—called there Palombes (*Columba palumbus*, our common woodpigeon) and Ramiers (*Columba œnas*, the stockdove). Directly one of the boys in the boxes aloft perceives any pigeons approaching he gives a peculiar signal of warning to the fowlers, and everything is made in readiness. On the birds approaching more nearly he launches into the air one of his *eperviers;* this falls with a whirring sound, such as I suppose a hawk would cause by his stoop. The unfortunate pigeons, thinking the arch-enemy is nigh, immediately fly down low towards the ground, and on seeking to pass through the spaces left in the row of trees, come against the nets placed to intercept them. The fowler then lets go his string, which passes through the pulley, and the net and birds come to the ground together. The season for taking pigeons in this manner begins on the 10th of September and lasts till the feast of St. Martin (October 11th). During the whole of this time the fowlers never leave their posts from dawn to dusk; their success is naturally very various. Sometimes they take many hundreds in one day, sometimes very few, and sometimes none. The birds pass at a greater elevation when the weather is fine and clear, and are then, of course, more likely to pass above the nets. The Palombes, although more numerous than the Ramiers, always fly higher, and are wilder and more difficult to take. The ordinary price of the former in the market at Bagnères is about twenty sous, of the latter only about sixteen sous a-pair. There is said to be no particular time of day at which the flights are more numerous; the only successful take I saw took place between 12 and 1 o'clock, P.M. A naturalist resident at Bagnères de Bigorre (who has an excellent collection of all the animal and vegetable productions of that part of the world) tells me that the ring dove never breeds there, but passes northwards, in the spring, in pairs, and (as we have seen) returns southwards, in the autumn, in small flights. This is very different from what is generally, I believe, the case in the British isles, where the ring dove, although collecting in flocks in the winter, is found in most localities all the year through.—*Philip Lutley Sclater; 49, Pall Mall, November* 12, 1855.

On the Habits of Megapodius Cumingii.—In Labuan these birds are not uncommon, and are said to be principally confined to small islands, to such more especially as have sandy beaches; they are very rarely to be seen, being extremely shy, and frequenting dense and flat parts of the jungle, where the ratans grow, and where the luxuriance of the vegetation renders concealment easy. The Malays snare them by forming long thick fences in unfrequented parts of the jungle, in which, at certain intervals, they leave openings, where they place traps; the birds run through the jungle in search of food, and, coming to this fence, run along it till they find one of the openings, through which they push their way, and are caught in the trap. In walking they lift up their feet very high, and set up their backs, something like Guinea fowls; they frequently make a loud noise, like the screech of a chicken when caught; they are very pugnacious, and fight with great fury by jumping upon one another's backs, and scratching with their long strong claws. Their food principally consists of seeds and insects; the eggs are of a fine dark cream colour and of a very large size, three of them weighing nearly as much as a full-grown bird. According to the account given by the Malays, each bird lays about eight or ten eggs at each time of breeding, and their nests are merely large heaps of shells and rubbish, deposited over the sandy soil, in which the eggs are buried to the depth of about eighteen inches. Since receiving this account, however, we have had an opportunity of inspecting a very large and perfect nest or breeding hill, and found it to be about twenty feet in diameter, and composed of sand, earth and sticks; it was close to the beach, just within the jungle, and scarcely above high-water mark, and appeared to have been used for many years. The boatmen seemed to have no clew to what part of the hillock contained eggs, but said that they were never without some when frequented at all; they sought for nearly half an hour in vain before they found one, and then they found about a dozen together; they were buried at a depth of from one to three feet in an upright position, and the ground about them was astonishingly hard. The eggs thus deposited are left to be hatched by the heat of the sun, and this, the Malays assert, requires between three and four months to complete: those obtained from this heap were brought home and buried in a box of sand, and a month or two afterwards it was discovered that they were all hatched, but that, from neglecting to place them in a proper (*i. e.* probably an upright) position, the chicks could not get up through the sand, and had all perished. When hatched the chicks are almost entirely fledged, even the long quills being, as the Malays say, "needled." When first dug out, some of the eggs had lost much of their outer colour, which appeared to have scaled off, leaving only a white chalky shell. On a former occasion some eggs were brought by the natives, and were buried in a box of sand and exposed to the weather: at the end of about three weeks one of the chicks was hatched; a Malay, who saw it emerge, said that it just shook off the sand and ran away so fast that it was with difficulty caught; it then appeared to be nearly half-grown, and from the first fed itself without hesitation, scratching and turning up the sand like an old bird. Two more afterwards emerged in the same state. Their eggs are held in such high estimation as food, both by natives and Europeans, that one cannot but fear that these interesting birds, though now so abundant, will ere long become scarce.—*Contributions to the Natural History of Labuan.*

Late Stay of Swallows and Martins in 1855.—I perceive that at p. 3753 of the 'Zoologist,' your correspondent, Mr. W. C. Hewitson, remarks, "I have never before this year had the pleasure of seeing swallows in November," and he goes on to record the occurrence of four house-martins at Oatlands on the 21st of November, 1852. I have a still more remarkable fact to relate: yesterday (December 6) there were several chimney-swallows flying about my house; the previous night there had been a slight sprinkling of snow in the adjoining country. On the 23rd of November I left the neighbourhood of Uckfield, in Sussex, and at that time there were *several* house-martins skimming about in front of the house, though the weather was anything but warm.—*Edward Vernon Harcourt; Hastings, December* 7, 1855.

Late Appearance of the Swallow Tribe.—I observed up to Wednesday last, in this district, extending as far as Helston, flocks of house-martins flying about, and hawking vigorously for insects.—*Edward Hearle Rodd; Penzance, December* 1, 1855.

Occurrence of the Sea Eagle (Haliaëtus albicilla) *in Norfolk.*—A fine specimen of this noble bird was shot at the beginning of this month near Ormesby Broad. It proves to be a female; apparently, by the beak and plumage, in its second year.—*H. Stevenson; Norwich, December* 12, 1855.

Note on the Hawfinch breeding in Norfolk.—I am indebted to Mr. King, bailiff to Lord Wodehouse, at Kimberley, for the following particulars respecting these birds: no doubt careful observation would discover them in many localities as suited to their habits, although, as Mr. Doubleday observes of those in Epping Forest, their extreme shyness and quick movements render them very difficult of approach. About the latter end of June last Mr. King, who lives close by the park, observed an old bird of this species and three young ones on a greengage-tree in his garden: on fetching his gun he succeeded in shooting one of the young birds, but has never seen anything of the others since. This was the first time he had observed them during the summer; in sharp weather he has frequently seen them on some large whitethorn trees in the park, a very favourite resort of the hawfinch. I have examined the captured specimen, which agrees very nearly indeed with Mr. Yarrell's description of the immature plumage; the head, neck and upper parts yellowish olive-brown and the throat yellow, but with no apparent indication of the black patch common to both sexes in an adult state. It is to be hoped that another summer may bring further proof in the appearance of a nest amongst the whitethorn bushes. I am aware of no previous record of their breeding in this county.—*Id., December* 10, 1855.

Occurrence of the Great Plover and Spotted Crake in Devonshire.—On the 24th of last month I bought an adult specimen of the great plover or thick-knee (*Œdicnemus crepitans*) in the Plymouth market, which was killed in the neighbourhood. I believe it is not generally known, but which from repeated examination I have found to be the case, that the enlargement of the knee-joints and tarsi of this species is confined to young birds only. A similar peculiarity of formation I have also observed to exist in the legs of the young green sandpiper. A fine example of the spotted crake (*Crex porzana*) was obtained in the vicinity of Plymouth a short time since, and others were seen in the same locality.—*John Gatcombe; Wyndham Place, Plymouth, December* 3, 1855.

Occurrence of the Stilt Plover (Himantopus melanopterus) *at Bosham, in Sussex.*—A magnificent specimen of this very rare bird was shot and preserved during the present month at Bosham, in Sussex, by Mr. A. Cheeseman: its legs measured eight inches in length, and its weight was but 4¼ ounces.—*Edward Newman.*

Occurrence of the Velvet Scoter at the Land's End.—A specimen of this duck, in very perfect plumage, was captured about ten days since at Whitsand Bay, near the Land's End: it is a bird of rare occurrence on the Cornish coast.—*Edward Hearle Rodd; Penzance, November* 26, 1855.

Remarkable Flight of Woodcocks.—The continuance of the north-east winds to the end of October, with a morning moon, brought a large flight of woodcocks in these parts, and I may say pretty generally throughout Cornwall. A young farmer in the parish of St. Buryan, within a few miles of the Land's End, killed fifty-four in one week, and vast numbers were killed in various directions throughout the district. By way of showing the extent of this great southern migratory movement, I may mention that Captain Tower, who lately was on a visit to Mr. Smith at Trescoe Abbey, Scilly, shot in one day thirty-nine woodcocks. All these early great flights of woodcocks consist, I have no doubt, of the main body, whose destination is the remoter southern latitudes; some, no doubt, remaining in the northern countries. The principal bulk, however, of those found throughout our shooting season are made up of smaller flights afterwards; and these again, when our winters are very severe, are driven down from all parts of England to our most southern and western peninsula, as I have often remarked (as last year), in the months of January and February.—*Id.*, *November* 12, 1855.

Note on the Iceland Gull and the Shore Lark in Norfolk.—During the first week of this month a male specimen of the shore lark (*Alauda alpestris*), assuming the winter plumage, and a nearly adult female of the Iceland gull (*Larus leucopterus*), were shot at Holkham, in this county.—*H. Stevenson ; Norwich*, *December* 10, 1855.

Question respecting the American Scaup said to have been taken at Scarborough.—In indexing the 'Zoologist' for 1855, my attention was attracted by a record forwarded by Mr. Roberts, of Scarborough (Zool. 4631), of the occurrence of the American scaup near that town; but the record is unfortunately unaccompanied by any description or further particulars. The bird to which this name was applied appears to have been considered by the late Mr. Vigors as an American variety of the common scaup (*Anas marila* of Pennant), and, if proved distinct from that bird, Mr. Vigors proposed to call it Fuligula mariloides. At this point all our knowledge of the bird appears to cease. Mr. Yarrell, however, gives, in his 'History of British Birds,' vol. iii. p. 247, under the same name, Fuligula mariloides or American scaup, the figure and description of a bird, in the possession of Mr. Doubleday, which was purchased in Leadenhall Market. In August, 1845, Mr. Fisher, then an active correspondent of the 'Zoologist,' communicated (Zool. 1137) an account of a duck, in the possession of Mr. Gurney, of Norwich, which had occurred on Rollesby Broad, near Great Yarmouth, and which, not appearing referrible to any described species, he supposed a hybrid between the common and white-eyed pochards: the same acute ornithologist subsequently described the same specimen (Zool. 1379) in his 'Account of the Birds of Norfolk.' In April, 1847, a third bird was purchased by Mr. Bartlett in a London market, and both that gentleman and Mr. Fisher agreed that it was of the same species as Mr. Gurney's; and the three birds, Mr. Doubleday's, Mr. Gurney's and Mr. Bartlett's, were exhibited by Mr. Bartlett on the 13th of the same month, at an evening meeting of the Zoological Society, as a new species of duck which he proposed to call Fuligula ferinoides; and Mr. Fisher published figures and description in the 'Zoologist' for May following, under the name of Paget's pochard or Fuligula ferinoides (Zool. 1778), a name which all ornithologists have received, and the name of American scaup or Fuligula mariloides has been removed from the British list. What, then, is the bird thus denominated by Mr. Roberts? Is it Paget's pochard, or a duck heretofore unknown as British? I shall consider it a great favour if Mr. Roberts or some other of my correspondents in the North will favour me with a reply.—*Edward Newman.*

Fresh-water Fish in Confinement.—With the remarks of your able correspondent, Mr. Newman, upon fish in confinement, I in the main agree; but on one or two points I beg to differ; first, with regard to the timidity of the loach, though undoubtedly it is a shy fish, but it will, with a little attention, become familiar; I have two exceedingly so; they rise and take food from the hand eagerly, and will even allow me to touch them with my finger. I have also kept them for months in a vessel, the sides being made of zinc—for a fresh-water aquarium I do not think it injurious. Again, with respect to the sluggish habits of that pretty fish, the gudgeon, it is, if so

I may express myself, a nocturnal fish—seeking the shade of weeds, stones, &c., during the day—rising into a state of great activity as night approaches, during the greater part of which it swims with as much ease and grace as any of the finny tribe: I have four, one about three inches in length, the others from one to two inches: I have also noticed their fins are free from the attacks of the pugnacious Gasterosteus, and also my perch do not seem to quarrel with them as with the dace, bleak or carp. The perch thrives remarkably well in confinement, and becomes very tame; its brilliant hues, graceful movements and its beautiful dorsal crest makes it a very attractive fish in the aquarium: soon after their introduction into my tank I was repeatedly struck by the daily decrease of some very small roach and dace, and for a long time was at a loss to account for it, until at length I found one morning that a perch had taken one too large to swallow—the tail of the roach was sticking out from its mouth: I relieved them, and both are now doing well: the perch are shyish during the middle of the day, but very active early in the morning; and in the evening, when at rest, they use their tail as a support, remaining perfectly motionless at an angle of about forty-five degrees, with the tail on a stone, and thus they remain for hours. My collection of fishes includes the bleak, carp, roach, dace, eels, gudgeon, perch, minnows, sticklebacks, tench, loach and gold fish, and all of whom thrive well, and are peculiarly adapted for the fresh-water aquarium.—*A. Horace Lloyd; 19, St. Paul's Street, New North Road, December* 12, 1855.

The Great Sea-Serpent.—The sea-serpent having again risen, phœnix-like, from the deep, in the pages of the 'Zoologist,' it may perhaps be pardonable to solicit insertion for the following attempt at explaining his reality, in some at least of the many instances of his reported appearance. Any one who has looked at the preserved remains of the great ribband or scabbard fishes, or who has even read the striking accounts of the huge size they sometimes attain, as well as their extreme rarity, may, like myself, have been thus reminded of those mysterious sea-monsters which are occasionally observed by the unlearned, to be no less a puzzle to learned opinion. When, too, we know that these fish are supposed often to swim at the surface, and thus to be driven ashore more readily, when the only example of whose healthy life we have a credible account, is described as advancing head above water, and by the undulating movement of his body (Yarrell, vol. i. p. 177), may we not reasonably suppose that there exists other and more gigantic forms of this most interesting race as yet uncaptured, and such as might easily simulate, in the waving of their long dorsal fin, the so-called "mane" of the great sea-snake.—*A. G. More; London, November,* 1855.

Observations on the Habits of the Stickleback.—During the early part of the last summer I had the good fortune to observe the whole progress of the various stages in the breeding of the three-spined stickleback (*Gasterosteus leiurus*), which will therefore enable me to complete the notice already published on this subject in the tenth volume of the 'Zoologist,' dated 1852 (Zool. 3633). In the account there given the observations extended to the completion of the nest by the male fish, and it is my intention in the present communication to carry on the details of the progress from that point, premising that the water was the same which had been employed for the original experiments of 1849, and that the fish contained in the aquarium consisted of three sticklebacks, one male and two females, two tench, and a gold-fish. The position selected by the male fish for the construction of the nest was between two plants of Vallisneria spiralis, at the point where the leaves spring from the root, and directly in front of a fragment of limestone which rose behind the plants and acted as a protecting background to the position. The nest being all prepared, exactly as before described, although by another individual, the eggs were deposited, I presume, during the night of May 8th: this was judged of, not from observance of the act of spawning, but from the altered appearance of the female fish evidencing that she had shed her spawn, from the immediate change made by the male fish in the arrangement of the materials forming the nest, and, likewise, the violent repulsion of the female from the neighbourhood of its position, to which previously he had been as assiduous in driving her. From this period the nest was opened more to the action of the water, and the vibratory motion of the body of the male fish, while hovering over its surface, caused, as before described, a current of water to be propelled across the surface of the ova: this action was repeated almost continuously. The apparent luminosity of the body, if I may so term it, also decreased, and in this state all continued without change until the 18th of May, making a period of ten days. After this date the whole nest was destroyed, and the materials of which it had been composed thrown aside, with the exception of a few wiry stems of a decayed water-moss, and a space cleared around the spot of about 3 inches in diameter; the mud or sand at the bottom being carefully removed with its mouth and carried in this manner to some distance, leaving the rounded stones of the gravel clean and free from any obstruction around them. Watching carefully for a short time, to understand what all this busy alteration indicated, I at last had the pleasure of observing, by the aid of a long-focused pocket-lens, some of the young fry—of course most minute creatures—fluttering upwards here and there, by a movement half swimming, half leaping, and then falling rapidly again upon or between the clean pebbles of the shingle bottom. This arose from their having the remainder of the yelk still attached to their body, which, acting as a weight, caused them to sink the moment the swimming effort had ceased. Around all this space above mentioned, and across it in every direction, the male fish, as the guardian, continually moved. And now his labours became still more arduous than they had been before, and his vigilance was taxed to the utmost extreme, for the other fish, three of them some twenty times larger than himself, as soon as they perceived that the young fry were in motion, used their utmost endeavours, continuously, to pounce upon the nest and snap them up. The courage of this little creature was certainly now put to its severest test, but, nothing daunted, he drove them all off, seizing their fins, and striking with all his strength at their heads and at their eyes most furiously. All the assistance that could possibly be afforded him was of course rendered, short of actual interference, by keeping them pretty well fed, in order to allay, if possible, their voracity. Another circumstance, which appeared to add greatly to the excitement that he was constantly subjected to, arose from the second female fish, being in spawn, endeavouring most pertinaciously to deposit her ova in the same locality, and hence rushing frequently down towards the spot; but the male fish was ever on the alert, and although he did not strike at her in the furious way he attacked the larger ones, yet, he kept continually under her, with the formidable back spines all raised erect, so that it was impossible for her to effect her apparent object. The care of the young brood, while encumbered with the yelk, was very extraordinary, and as this was gradually absorbed and they gained strength, their attempts to swim carried them to a great distance from the parent fish; his vigilance, however, seemed everywhere, and if they rose by the action of their fins above a certain height from the shingle bottom, or flitted beyond a certain distance from the nest, they were immediately seized in his mouth, brought back, and gently puffed or jetted into their place again. This was constantly occurring, the other fish being continually on the watch to devour these stragglers, and make a savoury morsel of these Lilliputian truants. Indeed, the greater number of the whole brood must have fallen a prey to their voracity, as it was only some three or four that reached a size to place them beyond the power of these destroyers. As soon as the young fry could swim strongly the parent fish gradually relinquished his duties, although a constant watch appeared to be still quietly maintained on their motions as they swam about near the surface of the water and among the floating leaves of the Vallisneria and Lemna. It is a curious circumstance, that, very soon after these young sticklebacks were left unmolested by their companions, both the parent fish disappeared, and I presume have died in some hiding-place among the rock-work; as though their allotted functions—namely, the propagation of their species—having been completed, their period of existence must terminate.*—*Robert Warington; Apothecaries' Hall, September* 11, 1855.

The Gonepteryx Rhamni question.—It is impossible to resist the evidence which has been brought to bear in your last number upon the natural history of our always-welcome brimstone butterfly. I will request, however, the privilege of a little space in your journal to make one or two remarks more, in that spirit, I trust, in which all scientific controversies should be conducted, and which has been so strongly inculcated in the writings and example of such men as Ray, White, Kirby, &c. Natural History is the business of few men's lives—it is the delightful recreation and study of many. The contemplation of Nature, in her wondrous and varied aspects,—the study of those beautiful Laws which the Creator, in his Infinite wisdom, has chosen to be the rule and guide of animated existence,—the patient and enduring research into that great scheme upon which all Nature is founded and built up,—is the object and aim of the naturalist's career; and he follows out this path, not only in searching among books the opinions and experience of others, but wherever the garden of the world is most beautiful—in grassy, flowery fields—in the solitude of the forest—in the cold gray of the mountain top—the student of Nature holds communion with those things for which his yearning after truth has induced him to search. Such a pursuit as this must never be sullied by recrimination among the pursuers, much less should we ever appear irritable if others differ with us in opinion, or consider our own experience and knowledge, however great, as an infallible and undeviating standard. If there is one thing more than another which I have been impressed with by the late discussion, it is the fact that there is a great deal of knowledge stored up in the minds of naturalists of the present day, as securely as their own cabinets are protected from the investigating propensities of Acari or Dermestes. One gentleman says that he has known for thirty years that G. Rhamni was not double-brooded and that the imago hybernated; and yet during that time we have had published the works of Stephens, Westwood, Jardine, Morris, &c., who have each recorded a different opinion. Linneus, in the preface to his 'Fauna Suecica,' quaintly remarks, "Longa denique experientia edocti mortales, plus cœperunt sapere." But how are we to begin to be wise, if the experience of practical men is bottled up, and explodes with indignation when some one less fortunate expresses an opinion that the only recorded doctrine is the correct one; and this question of hybernation is, I confess, to me one of great interest. At the risk of being thought obstinate, I must still express my opinion that the scheme of insect-life, so far as we understand it, is the death of the imago before winter—as soon, in fact, as the object of its existence is attained, viz. the procreation of its species; and the extent to which the pupa will bear cold, in comparison with the imago, has been a fruitful and interesting subject of comment in the 'Zoologist; and I think that, where the opposite fact is shown to exist, viz. when the imago can bear the cold, and the pupa, according to your experiments, cannot, this may be considered a casual and not a constant feature in insect-life. Mr. Doubleday, however, in a private note, dissents from this view, and, as I think his opinion at all times valuable, and especially so on practical points connected with the Lepidoptera, and, as I am sure any additional facts will be as interesting to your readers as they have been to me, I will quote (with his permission) a part of his letter. I will premise that the first part of the extract refers to an objection I took to his definition of a double brood in the 'Zoologist' for September (Zool. 4811): I suggested that every escape from the pupa in the same year ought to be considered a brood, otherwise the cycle of single-brooded insects being only completed in the two halves of separate years, the case would not be included in his definition. The following is the extract:—"I quite agree with you about double broods, and your definition is better than what I wrote in haste, though, at the same time, mine is correct. The changes are gone through in twelve months by each brood; for instance, the eggs of G. Illunaria are deposited in April—these hatch and produce moths in July, from which brood larvæ are hatched which become pupæ in the autumn, and produce moths the following March. The eggs of G. Rhamni, laid at the same time, produce larvæ which become butterflies in August, which live on till the following April, and then deposit their eggs: of course there is only one brood in the twelve months. Rumia Cratægaria differs from any other British species, as far as I am aware, in its broods: it emerges from the pupa state at three different periods of the *same year*, viz. April, June and August; but the June brood is not the produce of the April moths, but of those of the preceding August, which pass the winter in the *larva* state and feed again in the spring, while those from the June brood become *pupæ* in the autumn and produce the moths in April: the specimens which appear in June are always larger and finer in colour and markings than those of the other two broods. I cannot at all agree with you that the hybernation of the perfect insect can be called a casual occurrence: an event can only be casual which is out of the regular course of nature, which the hybernation of certain species is not. You say, but 'I still consider that the general scheme of insect-life is the death of the imago after the object of its existence is attained, viz., that of procreating its species.' I admit that this is correct; but many species never seem to have any sexual desire till after hybernation, and therefore without it the end of their existence would not be attained. I believe species which hybernate *never* copulate in the autumn (I am speaking of Lepidoptera). Out of the thousands of Glæa Vaccinii, Spadicea and Satellitia that I have seen at sugar in the autumn I never saw any attempt at sexual intercourse; but when they re-appear in the spring I have seen scores of pairs *in cop.* on the trees. I never saw Vanessa Io, V. Atalanta, or the last brood of Urticæ copulate in autumn: the males take no notice whatever of the females; but in the spring it is not uncommon to see half a dozen males after one female. You ask where Atalanta, Polychloros, &c., conceal themselves: I reply,—in crevices of old trees, sheds, or any convenient places they can find. Last winter some large stacks of beech faggots, which had been loosely stacked up in our forest the preceding spring, with the dead leaves adhering to them, were taken down and carted away, and among these were *many scores* of Io, Urticæ and Polychloros. Any mild day in the middle of winter, if you take a pair of fumigating bellows and blow tobacco-smoke into furze-bushes, you will drive out scores of Depressariæ, &c., which are hybernating there. The autumnal Tineæ, Cerostoma radiatella and costella, so common on oaks, live through the winter among the dead leaves, and re-appear in the spring in the most perfect condition, and live on often through May. I have repeatedly beaten them out when the ground was covered with snow." This extract is rather long, but I am sure none of your readers will regret it. In fact, I think I shall try some other *vexata quæstio*, in order to uncork the bottles in which our practical entomologists keep their valuable knowledge. With regard to the original question, we must, I think, consider this set at rest, unless some industrious naturalist finds the pupæ in winter, or a second Captain Watkins comes to the rescue, and discovers the larvæ *feeding in September*.—*C. R. Bree; Stricklands, Stowmarket, November* 7, 1855.

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* Printed in the 'Annals and Magazine of Natural History' for November, 1855, and communicated by the author.

Capture of Colias Hyale and C. Edusa in Sussex.—I have taken in this neighbourhood, towards the end of August of the present year, six specimens of Colias Hyale and a great number of Colias Edusa; the latter I shall be glad to exchange with any entomologist who may happen to have duplicates of the of the genus Thecla. —*J. J. Reeve; Newhaven, Sussex, November* 1, 1855.

Capture of Argynnis Lathonia in Norfolk.—In accordance with Mr. John Scott's suggestion in the 'Zoologist' (Zool. 4873), I beg to record the capture of two specimens of Argynnis Lathonia, about six years back, in a gravel-pit, near Harleston, in Norfolk: one of them is in Mr. J. Muskett's cabinet at Harleston; the other, which is a little damaged, in my own.—*Id.*

Mr. Scott's Note on Argynnis Lathonia.—I clearly understand the object of Mr. Scott's suggestion on the subject of Lathonia, but I do not think it would answer the purpose which the writer has in view. I saw a process only a few days ago of cutting light sovereigns, and I think the same might be practised with great advantage on the so-called "British" Lathonias and Daplidices. I would suggest that a committee of three be appointed to examine every specimen of such rarities, and that the committee be armed with scissors and absolute power to adjudicate on the authenticity of each specimen, and, if found a forgery, to cut each of the four wings transversely in half, and return the specimen thus mutilated to its lawful owner: the specimen might be mended with little trouble, but would ever afterwards bear the brand of being a forgery.—*Edward Newman.*

Double-broodedness of Notodonta camelina and Clostera reclusa.—In Mr. Edwin Shepherd's letter in the November number of the 'Zoologist' (Zool. 4899) on the "vexatissima quæstio" respecting Gonepteryx Rhamni, he seems to infer that Notodonta camelina is not double-brooded. That it was double-brooded I had long suspected, and have this year proved it to be a fact. On the 26th of May I found four eggs of some species of Notodonta on a birch-bush at Hampstead: I took especial care of them, in the fond hope that they might produce Carmelita. As may be expected, my hopes were blighted, "Parturiunt montes et nascitur Camelina." The larvæ were full-fed and spun up the end of July, and the perfect insects emerged about the middle of August. One of the moths was a female, and most certainly was not barren. Of the double-broodedness of G. Rhamni I know nothing, having had but little opportunity of examining its habits: so many entomologists have, however, entered the field, that I feel quite content to leave them to fight the matter out without entering the lists myself. I am decidedly, however, of opinion that many of those insects which we generally suppose to be single-brooded are occasionally (I will not say always) double-brooded: Clostera reclusa, for instance, is, I believe, generally considered to be single-brooded, but that the contrary is the case I have little or no doubt, and I think that the following facts will go far to prove the correctness of my supposition. On the 23rd of June I found a small brood of the larva of Clostera reclusa feeding upon aspen in the Crown Woods near Shooter's Hill: some of them were full grown, and the majority nearly so. These larvæ all produced moths during the month of July: they none of them remained in the pupæ more than ten days. Now, does it not seem probable that the eggs laid by these moths would have produced larvæ which would have been full grown in September and October, the usual time for finding the larvæ of Clostera reclusa: though the females laid plenty of eggs, they were unfortunately none of them fertile, so that I was unable to prove it as a fact. Surely the larvæ cannot be found of all sizes from May to November (for I have two or three now feeding, out of a few which I took on the 16th of October in the same place as the June brood), and yet produce only one brood of moths. I may add that, at the beginning of June, Mr. Bond gave me a few impregnated eggs of Clostera reclusa laid by moths which he was then breeding from last year's pupæ. From the larvæ reared from these eggs I bred a male insect on the 25th of October. I do not lay much stress upon this circumstance, because I know that the pupæ of the Bombyces are sometimes subject to premature autumnal maturity. Is it not, however, possible that there may be a very late brood of Clostera reclusa, the eggs of which remain dormant during the winter. I am otherwise at a loss how to account for full-grown larvæ as early as the 23rd of June, particularly after such a cold spring as that of the present year. Perhaps some of my entomological brethren can enlighten me a little.—*H. Harpur Crewe; Rossway, near Great Berkhampstead, Herts, November* 7, 1855.

Capture of Callimorpha Hera on the Coast of Sussex.—I beg to record, in the pages of the 'Zoologist,' the capture of a single specimen of Callimorpha Hera on the wing, in this town, on the 5th of September, 1855. I have presented the specimen to my friend Mr. H. Cooke, of Brighton, in return for his kind assistance to me in forming my small collection.—*J. J. Reeve; Newhaven, Sussex, November* 1, 1855.

Spiræa Ulmaria a Food-plant of Lampronia prælatella.—The larva of Lampronia prælatella "patronises this plant," as well as the wild strawberry and avens: I collected, a few weeks ago, a number of its cases, the larvæ in which were feeding on the radical leaves.—*George Wailes; Newcastle, November* 15, 1855.

Occurrence of Plutella annulatella at Newcastle in 1854.—It appears this beautiful species is still as scarce in cabinets as when I discovered its only English locality about thirty years ago, and then supplied, I believe, all the specimens in British collections, except Mr. Curtis's, who took it in Scotland. It seems to be equally rare or local on the Continent, where it bears the more appropriate name of "P. bicingulata," derived no doubt from the two white spaces or rings on the antennæ, which evidently have been overlooked in this country, probably owing to the paucity of specimens examined. I took it again in considerable numbers in 1854, but many of the specimens had been long on the wing and were somewhat wasted, and the long continuance of severe storms at the time of its appearance this year rendered fine specimens very rare, so that many of my duplicates are not *quite* so beautiful as I could wish.—*Id.*

Note on Tinea ochraceella.—I expected to have met with this species in our hill district, where the Formicaria are almost as numerous and as large as those at Rannoch; but although I searched them thoroughly, at the same time of the year as I took the species abundantly at its Scotch locality last year, I could not discover a single specimen. I may mention that a search at Rannoch the end of last August was equally unsuccessful: they were all over for the season.—*Id.*

Occurrence of Peronea caledoniana near Newcastle.—I took this at the middle of September, 1854, on one of our mountain heaths: it was a cloudy day, and they were flying abundantly over the heather: the previous day had been a hurricane of wind and rain, and the specimens were a good deal worn. On my visit a little earlier this season it was "blowing a gale," and I only secured a few by beating them up.—*Id.*

Occurrence of Anthrax Hottentota in Lancashire.—On the 12th of July last I captured Anthrax Hottentota, of both sexes, in abundance, on the sand-hills near Formby, Lancashire.—*Henry H. Higgins; Rainhill, Prescot, Lancashire, November* 3, 1855.

Duplicate Micro-Lepidoptera.—The offer of duplicate Colymbetes given in the September number of the 'Zoologist' has hitherto found no followers; I have for several years been in the habit of sending lists of my duplicates to my correspondents, which I have found a long, tedious and sometimes thankless operation (on one occasion an eminent entomologist abusing me for sending him a list of my duplicates), and it will be a great convenience to me if my list appears in print this year in the pages of the 'Zoologist'—those can then make use of it that like, and those that don't like can let it alone. My absence on the Continent during a whole month of last summer necessarily diminished, to a considerable extent, my doings at home; still I have so many trusty scouts constantly on the look-out in various parts of the country, that scarcely a day passes during the season that the post does not bring me living larvæ of some sort or other, and by this means a store is frequently accumulated of bred specimens of species but a few years ago considered rarities. The advantages attending the transmission of insects by post whilst in the larva or pupa state is obvious; they travel more safely, and by breeding and setting the perfect insects I can frequently obtain finer specimens than by trusting these processes to the tender manipulations of less-practised Micro-Lepidopterists. Of all the following species I have duplicates; in some instances the duplicates are few in number, and will probably hardly supply the first half-dozen applicants; but by hearing that such and such species are in great demand I shall be led to collect them more diligently during the ensuing season, so I would wish each entomologist who wishes for any of the following to enumerate them boldly, specially designating such species as he may not at present possess. This appeal is not confined to my existing correspondents, and I hope no collectors are too modest to apply.

Ochsenheimeria Birdella
Plutella porrectella
Depressaria umbellana
„ angelicella
„ applana
„ nervosa
Gelechia rufescens
Gelechia affinis
„ domestica
„ leucatella
„ Mouffetella
„ anthyllidella
„ næviferella
Butalis fuscoænea
Argyresthia conjugella
Gracilaria omissella
Ornix avellanella
Coleophora alcyonipennella
„ lixella
„ anatipennella
„ discordella

Coleophora troglodytella
„ lineolea
„ albitarsella
„ solitariella
„ limosipennella
Bedellia somnulentella
Chauliodus chærophyllellus
Laverna ochraceella
Elachista cerusella
„ rufocinerea
Lithocolletis lautella
„ Coryli
Lithocolletis salicicolella
„ carpinicolella
„ quercifoliella
„ Messaniella
„ corylifoliella
„ alnifoliella
„ stettinensis
Phyllocnistis suffusella
Cemiostoma scitella
Nepticula ruficapitella
„ pygmæella
Nepticula viscerella
„ catharticella
„ Septembrella
„ floslactella
„ Salicis
„ microtheriella
„ plagicolella
„ Tityrella
„ angulifasciella
„ marginicolella
„ aurella.

Those who are overrun with specimens of any of the following may send some of their superfluities to the undersigned, who will thankfully receive them: those to which an asterisk is prefixed he does not possess:—

Diplodoma marginepunctella
*Euplocamus Boleti
Tinea imella
* „ monachella
„ albipunctella
* „ simpliciella
„ nigripunctella
„ argentimaculella
Lampronia luzella
*Lamprosetia verhuellella
*Incurvaria tenuicornis
Micropteryx mansuetella
„ Sparmannella
*Nemophora pilella
„ Metaxella
Adela Sulzella
Nemotois cupriacellus
„ fasciellus
„ minimellus
Swammerdamia lutarea
*Anesychia pusiella
* „ bipunctella
„ funerella
„ decemguttella
Eidophasia Messingiella
*Cerostoma horridella
„ scabrella
* „ asperella
Depressaria carduella
„ granulosella
„ pulcherrimella
„ Douglasella
„ pastinacella
Psoricoptera gibbosella
Gelechia inornatella
„ nigra
„ fumatella
* „ divisella
* „ palustrella
„ sororculella
* „ cuneatella
„ alacella
„ politella
„ Galbanella
„ humeralis
* „ solutella
* „ celerella
„ maculiferella
„ punctella
*Gelechia littorella
„ atrella
* „ suffusella
„ lucidella
* „ nigricostella
„ pictella
„ brizella
*Anarsia Genistæ
Ypsolophus fasciellus
*Aplota palpella
*Sophronia humerella
Œcophora similella
* „ Woodiella
„ grandis
* „ formosella
„ lambdella
Butalis variella
„ chenopodiella
„ incongruella
Acrolepia perlepidella
„ betuletella
Röslerstammia Erxlebella
Glyphipteryx oculatella
Æchmia dentella.

I am compelled to cease my list here for very shame; I must send the remainder to the 'Zoologist' at the close of another season.—*H. T. Stainton; Mountsfield, Lewisham, near London, December* 12, 1855.

Duplicates of Micro-Lepidoptera.—Having supplied nearly all my usual correspondents, I find that there yet remain duplicates of some Micro-Lepidoptera, which I shall be glad to give to any one who will send a marked list, showing what species he wants. I make no bargains; but I shall be glad to receive Coleoptera, especially northern and mountain species.—*J. W. Douglas;* 6, *Kingswood Place, Lee, December* 18, 1855.

Localities of Elaphrus lapponicus and Agabus congener.—On the 13th of August last I started for Catlaw, determined, if possible, to fill up a long-lamented blank in my collection—that caused by the want of Elaphrus lapponicus. The greater part of the day was spent in exploring the mountain, but with little satisfaction, except that arising from the unexpected occurrence, upon the very summit, of Megacronus cingulatus, a species I had met with only in the lower districts of the country. Proceeding northwards I arrived in Glen Clova, a locality famous to botanists by the labours of Don and Gardiner. After spending four days in the neighbourhood I was at length rewarded by finding, on the ridge betwixt Loch Brandy and Loch Whorral, a single elytron! there, doubtless, any person of moderate industry may find the lovely creature in the month of June, and I trust the successful investigator will not forget my claim to a specimen on the day of distribution. Though forced to leave without accomplishing my chief object, I was fortunate enough to fall in with a few desirable species, as Miscodera arctica, Omaseus orinomus, Hydroporus halensis = griseostriatus, *Steph.* (one or two specimens only), Agabus arcticus (most of them recently fledged) and Agabus congener. This last species seems to be *alpine* in its predilections, for though, several years ago, I took a single specimen in Robrayston Bog, near Glasgow: the other Scotch localities with which I am acquainted in Rannoch and Mull are on rather high ground, affording the insect sparingly, while the little *peaty* pool in Clova, in which it was rather abundant, is about 2000 feet above the level of the sea. The specimens vary much both in colour and sculpture: Aubé's description of the species is full and accurate; he says it is pretty common in the north of Europe, but Erichson, Redtenbacher and Heer remark that it is rare in their respective countries.—*Robert Hislop; Blairlodge, near Falkirk, December* 6, 1855.

Actinia swimming in an inverted position on the Surface of Water.—I have often seen specimens of Limnæa stagnalis and other fresh-water mollusks swimming on the surface of my diminutive water-gardens, with their crawling disks exposed to the air. I have always been and still am completely puzzled both as to the *cui bono* and the *modus operandi* of this exhibition: I have never yet discovered for what good purpose or by what means the pleasing feat is performed. This, however, is merely the peroration. Yesterday, being Sunday, the 18th of November, my son called my attention to a mature, indeed venerable, specimen of Actinia Mesembryanthemum, indulging himself in a similar vagary. After having been quietly moored to a rock for some twelve months or more, he seems to have become possessed of a wandering spirit—to have heaved anchor—and to have cast himself loose upon the waters. There he was majestically and slowly gliding under the surface, for all the world like a ship keel upwards and with all her sails set, for his tentacles were spread abroad in the waters below, with as much complacency as if his base of operations were the very rock on which he had so long been vegetating. The broad disk by which he had formerly adhered was stretched to its fullest extent, and from exposure to the air had become perfectly dry. Mr. Douglas accidentally calling, his attention was invited to an exhibition as new to him as to ourselves, and the polype was soon afterwards compelled to abandon his inverted position; he sank moodily in the water, and has since returned to the usual sedentary pursuits of his kindred.—*Edward Newman.*

Observations on a Fresh-water Aquarium.

By George Guyon, Esq.

On a former occasion you inserted some notes I forwarded on a marine aquarium of small dimensions, which I established while in this island nearly two years ago. I now purpose to send you some unconnected observations on a *fresh-water* one, maintained during the greater part of the intervening period; and to this branch of the subject I would wish to draw the attention of persons having a taste for Natural History, as, although it is certainly inferior to sea-water aquaria in little-known and curious forms, still the fresh-water establishment is very interesting, and has the advantage of being attainable in any inland district with the smallest possible amount of trouble: it requires much less attention than its marine relative to maintain the balance between animal and vegetable life for a lengthened period; the aquatic plants seem less liable to decomposition; and the evaporation, which must constantly take place from an exposed fluid surface, does not, as in the case of sea-water, alter its density and change the proportion of its constituents; in fact, evaporation is of no consequence, as long as sufficient water remains for the movements of the animals and submersion of the plants. If unhealthy plants are replaced with fresh (which will seldom be required), and any dead animals removed, the aquarium will continue in a flourishing state, under the influence of light, for almost any length of time.

I commenced the establishment on the 21st of August, 1854, by procuring a glass gold-fish vase of two gallons capacity, and filling it to about half with river water, which, up to my leaving Richmond (October, 1855) has never required changing. Some sand and mud obtained in the river-margin was next thrown in, together with a few stones, and it was left till the next day to settle; I then introduced some river weeds, and at the same time procured some aquatic plants from a neighbouring pond, and the live stock was commenced in the shape of a common smooth water-newt and a few specimens of Limnæa stagnalis and other shells; this reptile and a specimen of Neritina fluviatilis, accidentally introduced with the river sediment, with a water-beetle or two (Hydroporus), are the only *aboriginal* inhabitants of the vase now living. The newt soon became tame enough to take food offered on the point of a piece of wire, not refusing anything in the shape of fish, flesh or fowl, roast, boiled or stewed; a fly would be readily taken, and even a crumb of bread or biscuit: after awhile it would raise its head, and seem to expect something eatable when I approached the vessel, but in taking it showed no great abilities; if the food sank on being thrown in, the newt, which usually floated with its limbs extended, never attempted to descend for it, and when the wire was thrust under to recover the food it would bite eagerly again and again at the middle of the wire, where it met the surface, without seeming to discover its want of nutritious qualities: for the first two or three months it lived constantly in the water, after which a slice of cork was thrown in, and then, having a choice, it abode on it for the greater part of the day: not unfrequently it appeared to be affected with palpitation or shortness of breath—if such an affliction extends to the newt family—at least the throat would show as many as 240 beats in the minute, a very different rate to its usual slow respiration; on these occasions it always kept the head out, and was generally on the cork, and if food was offered it would be refused, or taken with reluctance: on two occasions I found it looking very much as if seized with an attack of cramp, the limbs drawn up and the eyes closed with a very painful expression: a very interesting sight was presented when it happened to be resting at the side of the vessel with a foot touching the glass; the circulation of the blood was then clearly visible with a pocket lens, but though the red corpuscles were plainly seen returning from the points of the toes, I failed to detect them proceeding thither.

The movements of the newt appeared to me to be influenced by the electrical state of the atmosphere, at least more so than the *leech*, one of which I kept in a bottle a year or two ago without observing any of those weather-wise indications for which it enjoys a reputation: it appeared its practice to descend in the water and keep there during a storm. On the 9th of July there was thunder and lightning in the evening, and I found the newt, as I expected, totally submerged a full inch below the surface: on the 23rd of the same month it was very gloomy, and thunder at a distance, and the little meteorologist, true to his habit, was under water, and remained so for three hours, so far as was observed: I made the same remark several times, and only on one occasion, when the thunder was very distant and unaccompanied with lightning, did I find it resting on its floating island. Three small sticklebacks (taken on Wimbledon Common, and conveyed home by rail in a Preston-salts bottle, held out of the carriage window to keep the contents cool) were introduced at an early period, but none survived two months: their habits were very interesting, and their elegant shape, lively manners, and the ease with which they are procured, make them very suitable to form part of the live stock, where their pugnacity will not be injurious to their fellow-prisoners: their occupation seemed a perpetual seeking for food, in which they would often scrutinize the ground, head downwards, in an almost perpendicular position, the fins and tail quivering—varied by an occasional attack upon a comrade. I sometimes looked at them during the night, and always found them foraging. Contrary to the habit of the newt, they would readily dive after any food thrown in, and would often blow it from the mouth and seize it again with great dexterity. Whether the newt is fairly chargeable with any dark deeds connected with their disappearance, I cannot say, but on one or two occasions I observed it following them about the vessel with great determination, though at a sluggish pace that scarcely threatened their personal safety, added to which it never seized a fly or even a bit of meat without one or two bungling failures. On the other hand, either from instinct or experience, they evidently avoided its approach, while a stickleback I had some years ago would make repeated charges on a dace three times the size of the newt, and drive it about the tub. Specimens of Limnea and Planorbis bred freely; and in the spawn of the former, which was often attached to the glass, a revolving motion of the embryo could be clearly seen.

A few species of aquatic Hemiptera were introduced, and some of them were observed to make vigorous dashes towards a candle brought near the vase, following it round the glass. Unexpected forms would sometimes make their appearance, including sundry insect larvæ and two species (?) of Cyprides. I once observed two young Hemiptera, not a line long, bred in the vase, each examining a Cypris, turning it over, quitting it and then returning; the Cyprides remained floating motionless: doubting if they were alive I pushed them under with a wire, and they immediately swam away; hedgehog-like, they no doubt trusted in their defensive armour, but how the surface-swimming *'mips* managed to capture them is somewhat strange. During the autumn several curious objects attached themselves to the glass above the water-level, having much the appearance of minute carraway-seeds, with a small tuft projecting from the side: I watched them for a month or two, but could not ascertain their nature. I may observe, the vase was covered with a circular piece of glass, slightly raised by bits of cork to admit air, but restrain the movements of mollusks of unsettled habits. The insertion or selection of these disjointed observations must be left entirely to your discretion—

they are given as they occur to memory, or as notes were made at the time.

GEORGE GUYON.

Ventnor, Isle of Wight,
November 20, 1855.

On the Injurious Effects of an Excess or Want of Heat and Light on the Aquarium.—Temperature is a point requiring great attention in carrying out successfully the principles of a permanent aquarium. The mean temperature of the ocean is estimated to be about 56° Fahr., and this, under ordinary circumstances, does not vary more than about 12° throughout the different seasons of the year. The causes of this equilibrium will be readily understood when we take into consideration the effects that must be produced by the continued flux and reflux of the tides, and by the enormous streams of water which must be flowing from the Arctic regions from year's end to year's end in one constant current, and which, by their movement, must necessarily cause other currents to flow in and take their place, thus forcing, as it were, the heated surface-water of the tropical seas towards the colder regions of the globe. Again, the whole surface of the earth, submersed below the ocean, is protected by this fluid coating from the effects of the cooling influences of radiation on the one hand, and from contact with the currents of the atmosphere on the other; and hence we perceive an always existent cause for the maintenance of a steady, equable temperature by the waters of the ocean throughout the year. Many of the inhabitants of the sea are very sensitive to changes of temperature, and we find that a few degrees of variation will cause them rapidly to move their position and seek some cooler or warmer spot, as the case may be. In the ocean it will be evident that the creatures have the power readily to effect this under ordinary circumstances, by seeking deeper water not liable to be affected by atmospheric influences, by partially or entirely burying themselves in the sand or shingle, or by shielding their bodies under the protecting shadow of the rocks or growing vegetation. In arranging the rock-work in the interior of the aquarium, therefore, great care should be taken to keep these points in view, and to afford as much protection as possible to the creatures from the cooling influences of radiation on the one hand, and from the heat of the sun's rays on the other. From my own experience I find that the range of temperature should not be below 50° Fahr., nor above 70°; within these limits all appears to progress healthily, but beyond these points many of the creatures are rapidly affected. During the last long-continued and severe winter, it was found very difficult, in an ordinary sitting-room having a south aspect and a good fire maintained throughout the day—the tanks being also screened at night by a blind—to prevent the powerful cooling effects from radiation on a clear frosty night; and on three several occasions, marking exactly the three severest frosts that we experienced during the winter, the thermometer, immersed in an aquarium containing about thirty gallons of water, fell as low as 45° Fahr. The shrimp and crab tribes, and the Crustaceans generally, are especially affected by these changes, and on each of the three occasions alluded to, one or two individuals perished; the larger-sized prawns, as Palæmon serratus, appeared to suffer more readily than the P. Squilla, although this might arise from the smaller ones being able to find a shelter from the radiation by concealing themselves more completely among the rock-work or vegetation. Anthea Cereus is also very sensitive to considerable variations of temperature, falling from its foot-hold to the bottom of the tank apparently dead. Excess of heat and also strong sunlight are likewise to be as carefully guarded against; and I may state, as an evidence of this, that on a particularly hot day during the summer of 1854, being absent from home, the servant omitted to screen a small case from the sun's rays during the hottest period of the day, and on my return I found every creature dead. It contained an Anthea Cereus, Actinia Dianthus, two specimens of Athanos nitescens, and several others. Too much light has also the effect of rapidly propagating several of the minute animalcules of a green colour, as the Euglena and its congeners, which under this influence multiply so rapidly as to render the whole water of a grass-green hue; this will at times subside to the lower part of the tank as evening approaches and disappear in the shingle bottom, but immediately the morning light shines strong upon the aquarium it will rise like a thin green cloud and diffuse itself throughout the whole of the water. Although this animalcular growth is not unhealthy, yet it causes the aquarium to present a very unsightly appearance, and prevents all observation on the habits of the inmates. The want of light, I need hardly observe, causes the rapid decay of the vegetation, and the products arising from this change are highly poisonous to animal life, the whole contents of the aquarium becoming of a black colour, and very soon of an offensive odour.*—*Robert Warington; Apothecaries' Hall, September* 11, 1855.

Proceedings of Societies.

Entomological Society.

November 5, 1855.—John Curtis, Esq., President, in the chair.

The Meeting was made Special, in pursuance of a Requisition addressed to the Council, for the purpose of considering the By-Laws relating to Associates, and it was decided that these By-Laws should be annulled.

Donations.

The following donations were announced, and thanks ordered to be given to the donors:—'Smithsonian Contributions to Knowledge,' Vol. vii.; 'Eighth and Ninth Annual Reports of the Board of Regents of the Smithsonian Institution;' 'Descriptions of some New Marine Invertebrata from the Chinese and Japanese Seas,' by William Stimpson, Zoologist to the U. S. Surveying Expedition to the North Pacific, Japan Seas, &c., Lieut. John Rogers, Commander; all presented by the Smithsonian Institution. 'Proceedings of the Boston Society of Natural History,' conclusion of Vol. iv., and sheets 1 to 11 inclusive of Vol. v.; by the Society. 'Proceedings of the New Orleans Academy of Sciences,' Vol. i., No. 1; 'Constitution and By-Laws of the New Orleans Academy of Sciences;' by the Society. 'Patent Office Report—Agriculture;' by the United States Patent Office. 'Ninth Annual Report of the Board of Agriculture of the State of Ohio;' by the Ohio State Board of Agriculture. 'The Natural History of the Tineina,' Vol. i.; by the Editor, H. T. Stainton, Esq. 'Proceedings of the Royal Society,' Vol. vii. No. 15; by the Society. 'The Zoologist' for

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* Printed in the 'Annals and Magazine of Natural History' for November, 1855, and communicated by the author.

November; by the Editor. 'Revue et Magasin de Zoologie,' 1855, Nos. 8 and 9; by the Editor, M. F. E. Guérin-Méneville. 'The Journal of the Society of Arts' for October; by the Society. 'The Athenæum' for October; by the Editor. 'The Literary Gazette' for October; by the Editor. 'Entomologische Zeitung' for September and October; by the Entomological Society of Stettin.

Exhibitions.

Mr. Stainton exhibited, on behalf of Mr. Winter, a specimen of Phlogophora empyrea, a Noctua new to Britain, recently taken by him at sugar near Brighton; also some extraordinary varieties of Agrotis segetum and A. exclamationis. Mr. Winter also sent for exhibition a fine female specimen of Ennomos Alniaria, taken on a lamp at Brighton: the only other authentic British specimen of this species hitherto known was taken on the North Foreland Lighthouse several years since, and is now in Mr. Shepherd's collection.

Mr. Stainton exhibited, on behalf of Mr. Henry Cooke, a specimen of Polyommatus Agestis, which closely approached the Scotch specimens known as P. Artaxerxes, the pupils to the ocelli on the under side being obsolete.

Mr. Samuel Stevens exhibited a new British Tortrix, recently taken at Hayling Island, near Havant; also specimens of Goniodoma auroguttella, *F.-v. R.*, taken by him in August last, in the Isle of Wight; and a specimen of Dictyopteryx uliginosana, *Bent.*, from Ely, Cambridgeshire: the only two specimens of this last species hitherto known were taken near Yaxley many years since, and are now in Mr. Shepherd's collection.

Mr. Westwood exhibited a specimen of the rare Quedius dilatatus, found in a hive of the honey-bee, and also the net-work cocoons of Hypera rumicis; both communicated by Professor Henslow. The President remarked that M. Gory had informed him that he once took a number of the Quedius in Fontainebleau Forest, in the neighbourhood of a hornet's nest. Mr. Stevens said that a specimen had recently been taken by Mr. Turner in the New Forest, in the decaying carcase of a heifer. Mr. Waterhouse observed that M. Chevrolat had informed him that he found this species at night on trees infested with the larva of Cossus; and Captain Parry once found a specimen in his own garden under the loose bark of a tree so infested.

Mr. Foxcroft brought for exhibition a large collection of Lepidoptera and Coleoptera, taken by him during the past season in Scotland.

Mr. Syme exhibited specimens of the rare Sphærites glabratus, taken by him from fungi at Kincardine.

Mr. Stevens stated that, on his recent visit to Paris, he found a preparation of naphtha very successfully applied to removing grease from insects: he had, since his return home, found that a similar article was manufactured at Liverpool, and sold under the name of "Copland's Rectified Borneote of Petroline;" this he had found equally as useful as the French preparation for extracting grease, and exhibited a number of Lepidoptera and Coleoptera which he had so cleaned: the highly volatile nature of these preparations is said to give them an advantage over camphine for this purpose, in not requiring the specimens to be subsequently placed in magnesia or other absorbent powder.

Dr. Power exhibited specimens of Notiophilus rufipes, which species he had recently taken at Shirley, near Croydon, also near Gravesend, and at Cowley, near Uxbridge: he also exhibited an opaque female of Hydroporus picipes; in this species both sexes are usually glabrous.

The Rev. Hamlet Clark exhibited a new British species of Hydroporus, recently detected by him in the collection of Mr. Waterhouse.

Mr. Stevens exhibited a box of Coleoptera recently received from Mr. Wallace, at Borneo, containing many new and fine species, especially amongst the Longicorns.

Mr. Newman read the following notes, exhibiting the insects to which reference is made:—

Silk-spinning Acarus of the Furze, &c.

"I beg to exhibit a mass of silk spun by a minute Acarus, and obligingly handed me, together with multitudes of the little specimens, by Dr. Milner Barry, of Tunbridge Wells, who writes as follows:—'When strolling across Rusthall Common this afternoon I noticed some red powder lying in thick cobwebs entangled in the furze: I took up some of the powder, and found it was living and moving, and consisted of myriads of vivacious red insects resembling Acari.' When the mass reached my hands it was of the size and shape of a sparrow's egg, the Acari running over it in all directions, and each adding to the bulk by leaving behind him a continuous thread of the finest conceivable silk. I subsequently sent the mass to Mr. Meade, the Arachnologist, who has carefully examined it, and kindly sent me the following information:—'The minute animals inhabiting the curious cocoon you sent me are Acari, belonging to the genus Tetranychus of Dufour, the type of which is the little red spider so injurious to plants in hot-houses and rooms, the Acarus telarius of Linnæus: most of the species live in society, on plants, and possess the power of forming webs: Koch says, when speaking of an allied species, Tetranychus socius, 'It appears in certain years in such numbers that it covers the trunks and the branches of the lime-trees which it frequents, with such a thick web that they look as if clothed with glazed satin.' I cannot find any description of the species sent by you, although it is closely allied to the common Tetranychus telarius, and I never before saw or found anything like the curious nest which it inhabits.' Since the receipt of Mr. Meade's note I have paid some little attention to the Tetranychus telarius, and find that the net-work of infinitely minute silken threads is admirably adapted to its singularly formed feet, and these are equally well adapted to the office of holding on while it perforates the cuticle of the leaf with its rostrum: its hold is so secure that no amount of washing by means of a garden-engine seems to have the effect of removing it: as I have no doubt whatever that these little creatures are exclusively vegetable-feeders, the web cannot serve, as in spiders, the purpose of securing prey, and it is, moreover, never accompanied by the glutinous particles which render the web of spiders so adhesive: as a matter of course, if the Acari can resist the action of a water-engine they have little to fear from the effects of rain."

An Australian Bombyx escaping from its Cocoon in England.

"I beg to exhibit a male specimen of the Entometa obliqua of Walker, an Australian moth, allied apparently to Zeuzera, Œceticus and Psyche: the insect has recently emerged from a sack-formed cocoon, and had it escaped and been captured on the wing it would doubtless have found a place in our catalogues. Mr. Oxley, to whom I am indebted for the loan of the specimen, exhibited the cocoon, amongst others, at one of our meetings last year, and adds the following information:—'Although I am unable to state at what date the cocoon in question was collected, yet I may observe that the last cocoons of any kind that I collected in Australia were obtained in March, 1854, a month equalling the September of this country. The long period of fifteen months that this moth must have passed in the pupa state I attribute to the rigours of a passage round Cape Horn and to the intense cold of the last English winter.' In reference to this note, I may remark the pupa state in Eriogaster, and many allied genera, is of very inconstant and uncertain duration, and that the same irregularity may possibly take place in certain Australian Bombyces."

Abundance of Noctuidæ, &c.

Extracts were read from letters to the President from Mr. T. Allis, of York, on the abundance of Noctuæ generally in the North of England during the past summer; and from Mr. J. Hogg, of Stockton-on-Tees, also remarking the abundance of Noctuæ, and the comparative rarity this autumn of the common wasp (*Vespa vulgaris*).

Gall-fly of the Oak.

The President communicated the following note on Cynips:—

"When Mr. Haliday visited Glanville's Wootton last month, he collected some galls from the oaks, which he put into a bag, and on the 22nd ult. he writes to me from Dublin to say that 'On examining the bag some days since I found several dozens of the Cynips out, but not one Callimome. It seems marvellous how the fly can escape through so small an orifice as it leaves, and I should like to see one emerge. I cannot identify it with any Linnean or Fabrician species, but it is the C. lignicola* of Hartig, and the only one of that group to which the insect of the ink-gall belongs which occurs so far North as England or even Northern Germany. This group, distinguished by the pubescence extended to the posterior segments of the abdomen, includes the largest species of the genus, and those which cause the most elegant and largest galls.' This, I presume, is the Cynips I consider as the C. Quercus-petioli of Linnæus."

December 3, 1855.—John Curtis, Esq., President, in the chair.

Donations.

The following donations were announced, and thanks ordered to be given to the donors:—'The Zoologist' for December; by the Editor. 'The Entomologische Zeitung' for November; by the Entomological Society of Stettin. 'Ueber die Micropyle und den feinern Bau der Schalenhaut bei den Insekteneiern;' by the Author, Prof. Rud. Leuckart, in Giessen. 'On the Illumination of the Diatomaceæ, when viewed under the Microscope;' by the Author, Thomas Sansom, A.L.S., &c. 'The Journal of the Society of Arts' for November; by the Society. 'The Literary Gazette' for November; by the Editor. 'The Athenæum' for November; by the Editor.

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* "Mr. Dale's specimens have also hatched; yet, abundant as the gall now is, he had not the species before."—J. C.

Election of Members.

Octavius Pickard-Cambridge, Esq., Bloxworth House, near Blandford, Dorset, was elected a Member of, and R. B. Were, Esq., 35, Osborne Terrace, Clapham Road, and Horace Francis, Esq., 38, Upper Bedford Place, Russell Square, were elected Subscribers to, the Society.

Exhibitions.

Mr. Edwin Shepherd exhibited a beautiful pair of Trochilium scoliæformis, *Borkhausen*, taken with other specimens by Mr. Ashworth, at Bryn Hyfryd, near Llangollen, in North Wales. This insect has just been described for the first time as British in the December number of the 'Zoologist,' p. 4928, by Mr. Newman.

Mr. Stevens exhibited a few drawings of the larvæ and pupæ of some of the Lepidoptera of Port Natal, made there by Mr. R. W. Plant; also perfect insects of some of the species, whose early states were figured.

The President exhibited some drawings of insects made by himself, and made the following communications respecting them:—

"1st. A very pretty variety of Vanessa Urticæ, given to me by F. Trenchard, Esq. The specimen was taken by himself 'near the entrance-gate in Bishop's Wood, Hampstead, July 21st, 1838.'

"2nd. A drawing of a caterpillar which I made when at school, and first noticed in the second edition of my 'British Entomology.' It seems to be the larva of Sphinx Celerio, yet it does not accord with any drawing or engraving I have seen: it is of an obscure flesh-colour, with a large round black spot on each side of the first abdominal segment, with four minute white dots on each, and the outer edges forming two straw-coloured lunules; behind each, on the second segment, is a smaller oval yellowish-white spot. The following memorandum was made at the time:—'Two of these caterpillars, from one of which this drawing was taken, were found in the arms of an old garden-chair, in a garden near Bishop's Bridge, Norwich: they began to spin up amongst some leaves in a pot on the 8th of October, 1810: they fed on the Persian willow (*Epilobium angustifolium*). In the other specimen there were five minute dots on one side and but three on the other: the white spot in my drawing is a little too large, and the tail of the other caterpillar was longer.' They were in the possession of a schoolfellow, Howard Sims, and changed to chrysalides amongst some leaves, from which the moths never emerged, owing to the frequent disturbance of them.

"3rd. A drawing of Hygrotus bisulcatus, which I described in the 'Annals of Natural History,' and which is quite distinct from any of the European species that have fallen under my notice.

"4th. A drawing of the Apion named after me, in 1817, by the Rev. W. Kirby. I am very desirous of laying this sketch before the Society, in order to correct a misstatement which I should be sorry to see repeated. Being at that time on a visit at Barham, I took a single specimen of an Apion, which Mr. Kirby decided to be unknown to him, and of which he made a detailed Latin description for publication, and I made the drawing: being in my youth at the time, Mr. Kirby paid me the compliment to name an Apion after me; I could not but feel gratified, and although I believe Mr. Kirby's description was never printed, Mr. Janson is quite mistaken in supposing that I had named the Apion after myself, or that it was a discovery since 1839, as assumed in the 'Entomologist's Annual:' the latter misstatement is corrected by the above date, and I should be sorry to be considered capable of such a contemptible act of egotism as to name an insect after myself. The truth is, that Mr. Stephens having with queries described a mere variety of a common and very distinct species as the Apion Curtisii, it became necessary to identify the type, which I did by describing it in the 'Annals of Natural History' as the Apion Curtisii of Kirby's MSS. Whether Mr. Kirby's description, with many others of which I have copies, were handed over to Mr. Stephens with the MSS. of the Staphylinidæ, is unknown to me."

Mr. Stevens remarked that this Apion remained unique until he had the good fortune to take the species at Little Hampton and near Arundel.

The President also communicated the following note:—

On the Genus Conops.

"Little is known of the economy of this beautiful genus of flies, except that C. flavipes has been bred from the body of an Osmia, which had nidified in bramble-stems. Other species have also been stated to be parasitic on the Bombi, and Conops auripes is supposed to lay its eggs on the body or between the abdominal segments of Bombus hortensis. As there are eight or nine British species of Conops, some of which are occasionally tolerably plentiful, it would be very desirable that Mr. Walcott, Mr. Smith and other entomomologists who pay so much attention to bees, should bear this subject in mind.

"My principal object, however, is to make known the localities of two rare species of Conops which are merely recorded in Mr. Walker's first volume of the Diptera in the 'Insecta Britannica' as 'Rare' and 'Very rare':—

"1. C. macrocephala, *Linn.*, described and figured in the 'British Entomology' in 1831, was first captured in England by Mr. Dale, who took a single specimen on the 18th of August, 1824, on the flowers of Scabiosa succisa in a meadow at West Hurn, Hants, and he has taken a second specimen, on the 23rd of June, 1846, on a path in Boscomb-chine, which he kindly added to my collection: I also possess another, taken last summer near Rannoch, in Perthshire, by Mr. Foxcroft. They resort to Orchis flowers; and all that I have seen are females.

"2. C. nigra, *De Geer.* This species has also been captured in Scotland, in Sutherlandshire, in June. Where Mr. Desvignes' specimen was taken Mr. Walker does not state; it is merely indicated as an English insect."

Note on Quedius dilatatus.

Mr. Westwood said, with reference to the specimen of the beetle exhibited at the last meeting, that he had received a note from Mr. Johnson (from whom, and not from Professor Henslow as reported, he had received the beetle), enclosing a note from Mr. Wighton, of Cossey Hall, stating that although he found the insect in a bee-hive, it was in a nest of hornets built therein.

The following notes by Mr. Newman were read:—

The old Aurelians outdone.

"At the November meeting Mr. Foxcroft exhibited some mutilated specimens of Endromis versicolor—mutilated, I mean, by sundry tears and rents in their wings. Every entomologist knows how these fellows wander all day long 'on amorous thoughts intent.' Who has not watched them in the 'Kentish glory field' at Birch, flying high over the heather, or dashing themselves incontinently against the polished stems of the birches? Now I know not whether our most sagacious friend had literally 'clipped the wings of Love,' but, although 'love is (proverbially) blind,' he certainly assured us that he followed these 'blind guides,' and profited by the clipping, for it seems no amount of mutilation (of the wings) interferes with the amorous instinct, and that these cripples continued to tumble about amongst the heather and dwarf birch-trees, until they led him to female 'glories,' which he forthwith impaled. Harris, Haworth and Hatchett, our guides and philosophers in mothcraft, have bequeathed to us instructions how to employ maiden females as man-traps to decoy the unwary and too-amorous males; but this is the first time the male has turned traitor, and lent his services to disclose the virgin's bower."

Mr. Douglas remarked that once at Wickham, Messrs. Farr, Fisher and himself took females of Lasiocampa Rubi by watching the spots where the males congregated.

A Fact bearing on the Function of Antennæ.

"It will be recollected that in an early Part of our 'Transactions' (Trans. Ent. Soc. ii. 229), there is a paper by the late Mr. Newport, 'On the Use of the Antennæ of Insects,' in which that eminent physiologist contends that they are auditory organs. We all admit that the subject is surrounded with difficulties, and therefore it is not very astonishing that the learned author failed to convince many of his readers, myself among the number: it has lately attracted attention from another point of view. In tetraperous insects the antennæ are invariably two, but in some of the apterous they are four at least; in others they are altogether wanting, and it is an interesting fact, and possibly a bit of collateral evidence in favour of the feeler hypothesis, that where this is the case the legs are eight instead of six, and the first pair actually perform the part of feelers: when we watch the spider, whose sense of touch is so obvious and so exquisite as to have excited admiration in all ages, we cannot resist the conviction that, whatever other function may be entrusted to them, the anterior legs are certainly organs of feeling. In the Crustacea we have to deal with other facts and another structure: the legs are ten instead of eight or six and none of them are either homologically or analogically the substitutes for, or representatives of, antennæ, since normal antennæ are not only present, but are always twice, and sometimes three or four times as many as in tetrapterous hexapods. Physiologists have theorized very differently on the functions of these multiplied antennæ. Milne-Edwards considers the shorter or inner pair as auditory organs; he is confessedly influenced by the supposed auditory chamber situated at their base, and he leaves the exterior or longer pair to be considered olfactory or feeling organs; but Mr. Spence Bate, in a paper lately published in the 'Annals' (No. 91, dated July), attempts exactly to reverse this theory, contending, at great length, that the long exterior antennæ are auditory, the short interior ones olfactory. Recent observations on the living prawn (*Palæmon serratus*) throw grave doubts equally over the generally received view of Milne-Edwards and the more elaborately argued, but more hypothetical suggestion of Mr. Spence Bate. The antennal system of the prawn, although familiar to the Crustaceologist, is perhaps not equally so to the general entomologist, and therefore a brief description may not be out of place: the antennæ are eight in number: conventional and technical usage,—whether wisely or not who shall say?—reduces them to four: all are alike in structure, filiform and multiarticulate; the exterior on each side is the longest; the other three are of different length, are united at their ba and are seated on the summit of a stout triarticulate footstalk. These three antennæ a invariably called 'branches' by the closet-naturalist; but the field-naturalist and th physiologist must of necessity call them 'antennæ;' first, because not apprised of the co ventional usage respecting them, and, secondly, because, reasoning on the fact that th branches of the antennæ in true insects are never articulated, they do not expect to fin multiarticulate branches in the antennæ of any animal. It may be very easy to argu that the two longest of these many-jointed threads ought to be ears, and that the othe six ought to be noses, or *vice versâ*, but seeing how precisely they agree in structure,—seeing that the microscope fails to detect a difference,—and seeing, moreover, as we sha see, that there is no perceptible discrepancy in the mode in which the living animal ma be said to handle these weapons of perception, it is very difficult to convince the matter-of-fact mind of a naturalist that the argument is conclusive or the hypothesis established Thanks to Mr. Warington, the prawn is now as easily kept in confinement as the rabbi or the guinea-pig, and we have every opportunity of observing how he behaves himsel both under congenial and adverse circumstances: under every condition the antenn are constantly in action; always also acting in concert, as by a common impulse for common object. Mr. Warington, in his admirable account of the prawn, in a lat number of the 'Zoologist,' says that he considers the sense of smell as residing mos strongly in the antennæ; and he relates, far better than I can, the wonderfull beautiful manner in which the prawn appears to hunt its food by scent. The followin experiment I have often tried, and invariably with the same result:—Fix on the poin of the usual feeding-fork a small piece of meat; plunge it in the sea-water nea the prawn, but not near enough to touch or disturb him; then draw it through the water to the most distant part of the vessel, bring it to the surface, disengage it from the fork, and let it fall gently to the bottom. In a very few seconds the prawn become aware of the operation; he knows that food is or has been in his vicinity; he stand erect on his legs; he lashes the water with his antennæ, and, rising from the make-believe rock whereon he was previously resting, hovers in mid-water, still waving his hair-like antennæ until one of them has bisected the line of transit of his food: this line ascertained he follows it without hesitation; ascends to the surface; plunges to the bottom; seizes the meat with his claws and conveys it to his mouth: during th entire operation, seldom prolonged beyond a minute, the motion of all the antennæ i constant and indescribably beautiful; and it would require a far keener eye, a fa more vivid imagination than mine, to detect or to suppose an auditory faculty exercise by some of them and an olfactory one by others. A second and even a third praw will sometimes follow the trail after the first has passed, and I have seen three at onc in active pursuit, like fox-hounds running with the scent breast-high. It is difficul in such a case as this to escape the conviction that the antennæ ascertain the cours to be taken: to see the creature would remove the doubts of the most sceptical on thi point; at first all the antennæ are porrected, but when the trail is once struck, and th pace of the hunter consequently improved, pair after pair bend back, with the rapidit of the motion. It is equally difficult to imagine that the passage of the meat throug the water has left a sound: savour or odour are probable, sound certainly improbabl Thus as, in the first instance, we are willing to believe that the antennæ guide th creature to its food, so, in the second place, we are willing to conclude that the sense of touch and smell are those most likely to be called into action by a substance totall incapable of producing sound."

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Can any reader of the 'Zoologist' describe the characters of the young of the Trumpeter (*Psophia*) and Screamer (*Palamedea*)?—*E. Newman.*

Gonepteryx Rhamni.—I feel flattered and obliged for the numerous papers on this subject, but think it has now received a fair share of my pages: up to the date of the last printed contribution each has been published in order of priority: a vast store has since been received, and excellent arguments are adduced why this insect cannot be and why it must be double-brooded. Will the writers severally give me permission to hand them over to Mr. Stainton for his next year's 'Annual?' to the authors whose works Mr. Stainton reviews these gentle effusions will be as balm in Gilead.—*E. Newman.*

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